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# COMBINED ARTIFICIAL PNEUMOTHORAX AND PHRENICECTOMY FOR THE CLOSURE OF DIFFUSELY ADHERENT TUBERCULOUS CAVITIES*


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The most valuable single method of collapse therapy of pulmonary tuberculosis is artificial pneumothorax. Unquestionably it has vastly improved the treatment of tuberculosis and is attested by the experience of many men. Unfortunately there are many patients in whom it is not successful.

Statistics clearly show that unless artificial pneumothorax produces a closure of tuberculous cavities and adequate rest of the lung, we cannot expect much in the way of ultimate results. It is obvious then, that any measure that would improve the end results or would contribute materially to the closure of cavities in conjunction with artificial pneumothorax would increase the benefits to the patient, as well as prevent this valuable procedure from being abandoned in view of some other means of collapse therapy.

It is with this end in view that the following cases are brought to attention whereby it is possible to close upper-lobe cavities diffusely adherent to the chest wall that are non-compressible under pneumothorax treatment alone by a combination of artificial pneumothorax and phrenicectomy. This form of treatment is maintained in no way to conflict with the closure brought about by the combination of intra-pleural pneumolysis as an adjunct to artificial pneumothorax, because of the fact that in the cases cited there was in no instance a pleural adhesion of the type amenable to cauterization to interfere with the proper application of artificial pneumothorax, nor was intra-pleural pneumolysis in any case indicated.

The value of phrenic evulsions as an accessory to pneumothorax in the obliteration of upper-lobe cavities has been repeatedly stressed in literature. The literature fails, however, to go into much detail or comment on the mechanics of the treatment, and as far as I can determine little has been written concerning the consecutive phases in the closure of cavities of this type and their relationship to the pressure condition within the pleural enclosure. It seems that nearly all authorities maintain that the effect of phrenicectomy is based largely on the rise of the diaphragm. R. W. Matson[1], in an article appearing in the "American Review of Tuberculosis" in the July, 1930, issue, entitled "Exairesis of the Phrenic Nerve in the Treatment of Pulmonary Tuberculosis," maintains that the results of an induced diaphragmatic paralysis, unilateral, are more dependent on the rise of the diaphragm or the degree of collapse of the lung tissue effected thereby, than upon merely placing the diaphragm at rest. The best results, he maintains, have always been associated with a marked rise of the diaphragm, and the poorest results have been in those cases in which little or no rise of the diaphragm took place.

E. J. O'Brien[2] maintains that the use of

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phrenicectomy as an adjunct to pneumothorax is indicated when adhesions to the lateral wall or apex prevent proper collapse of the cavity, especially if the base of the partially collapsed lung is adherent to the diaphragm and it appears that the ascent of the diaphragm in the chest will cause a relaxation of the tissue of the lung and allow a continuation of pneumothorax to cause full collapse of the lung.

The literature is filled with statements that tend to show that there is no exact appreciation of the physiological effects of evulsion of the phrenic nerve.

As an illustration of this I might cite Edwards' wherein he states that in cases where pneumothorax was used but which showed a tendency to open cavitation in the middle areas, there was a complete closure of the cavities by the rise of the diaphragm after phrenicectomy without the necessity of cauterization, and yet in the same article he admits that there appears no certain knowledge regarding the physiological effects of the evulsion of the phrenic nerve. There are many instances in the literature covering the increased collapsibility of the treated lung with a paralyzed diaphragm, but as was said in the foregoing, there is little to be had in an interpretation of the mechanics dealing with this effect.

In all this work there are few roentgenograms that stress the behavior of the cavities during the entire course of compression treatment. Most of these illustrations show the condition prior to the institution of compression therapy and after the closure of the cavity, without showing the ways in which the obliteration of the cavity is related to the compression procedures.

It might be well to say a word at this point concerning the mechanism of gas localization in the pleural cavity. The elastic tissue of the lung, like any other elastic substance, possesses both an expansile and a contractile force. Both these forces come into play in the physiologically functioning lung which is kept expanded in the air-tight pleural enclosure by virtue of the difference between the intra-pleural and intra-pulmonary pressures to which it is subjected. The intra-pulmonary surface is exposed directly to atmospheric pressure through its air passages, whereas the rigid wall of the thorax transmits only very little, if any, of the atmospheric pressure through its pleural surface, and the extremely distensible alveoli yield therefore to the atmospheric pressure, putting the entire lung on a stretch. The intra-pleural pressure is therefore equal to the atmospheric pressure minus the tension of the expanded lung,

Any force that increases the intra-pleural pressure curtails the expansion of the lung, and this curtailment is directly proportional to the difference between the intra-pleural and intra-pulmonary pressures. Air introduced into the pleural cavity materially increases the intra-pleural pressure, but as long as this pressure is below that of the intra-pulmonary, the expansion of the lung will assert itself with each inspiration. When the intra-pleural and the intra-pulmonary pressures are equalized the contractility and expansibility of the lung tissues are in a state of equilibrium.

It will be readly understood that pathologic processes may diminish either the expansibility or the contractility alone, or both these properties might be lost at the same time. In atelectasis the expansile force of the pulmonary tissue is reduced, yet the contractile force is present. In hypertrophic emphysema the expansibility is present but the contractility is diminished. In caseous areas of the lung the expansile and the contractile properties are lost entirely; consequently such tissue will yield easily to any external pressure to which it might be subjected. Fibrous tissue possesses intrinsic contractile power to some degree, but it is very resistant to external forces; however once compressed it will never tend to re-expand. A tuberculous lung almost always exhibits all these pathologic processes in various proportions.

When a small amount of air is introduced into the pleural cavity of a chest containing a tuberculous lung free from adhesions, it will distribute itself according to the degree of resistance offered to it by the various portions of the involved pulmonary tissue. The caseous, soft areas are the first to cave in, the edematous and slightly infiltrated tissues follow, whereas the uninvolved elastic lung tissue expands fully with each inspiration and displaces the introduced gas or air into the area left by the compressed inexpansible diseased portion.

Since the upper-lobe is affected in the great majority of cases of pulmonary tuberculosis an erroneous impression was gained by some that gas introduced into the pleural cavity will always compress the apex first. Such, however, is not the

case, Due to these biophysical laws of pneumodynamics just explained, gas injected in small amounts will, as a rule, localize over the diseased pulmonary area no matter where it may be situated—apex, middle portion, or base, provided no pleural adhesions are present.

The difference in consistency of pathologic and normal anatomic lung tissue is another fundamental principle influencing the localization of gas in the pleural cavity. Soft and edematous lung tissue contains little air, and it requires but little compression to render such tissue entirely airless, reducing it to a solid mass until it reaches the limit beyond which it cannot be compressed any further. The volume of functioning lung tissue, like a sponge, consists of a great deal of air enclosed in its alveoli, and therefore when it is rendered into an airless and solid mass by high intra-pleural pressure it is reduced to a much smaller volume than the diseased tissue would be under the same force of compression. This is the fact that caused the older observers of artificial pneumothorax to think erroneously that healthy lung tissue becomes more easily compressed than diseased tissue, because they administered larger amounts of air, creating a positive intra-pleural pressure often very high when measured in millimeters of mercury.

In this series of cases treated by pneumothorax with added phrenicectomy the changes in the cavity have been observed by frequent fluoroscopic examinations and serial roentgenograms. A study of those changes shows that induced pneumothorax displaces an upper-lobe cavity downward and inward, provided the cavity is not diffusely adherent to the chest-wall. This displacement is a result of the property of the treated lung to retract under compression toward a fixed point, attachment to the hilum. Along with displacement, compression of the cavity may take place in the same direction. If the cavity is attached to the parietal pleura by string or band adhesions with a limited capacity for stretching and, if one of the adhesions ceases to yield before the cavity is closed, the latter becomes suspended between two fixed points: (1) attachment to the hilum, and (2) attachment to the fixed adhesion. Further raising of the pneumothorax pressure tends to continue compression of the upper-lobe toward one of the fixed points. The direction, in which the upper-lobe retracts now, is the resultant of two counteracting forces applied to the lobe: (1) tension toward the root, and (2) contraction capacity of the stretched adhesion. With an active diaphragm, tension toward the root dominates and the upper-lobe continues to retract toward the same fixed point, attachment to the hilum. The cavity, held out by a fixed adhesion and unable to recede more from the chest-wall, is pulled by the retracting upper-lobe toward the root. Stretching and enlargement of the cavity results. Following paralysis of the diaphragm there is a gradual relaxation of the treated lung and abatement of its tension toward the root. The contraction capacity of the stretched adhesion becomes the prevailing force, and the upper-lobe commences to retract in a reverse direction, away from the hilum toward the second fixed point. Tugging on the cavity ceases and its compression proceeds toward the attachment to the adhesion. Closure of the cavity is not influenced by the amount of elevation of the paralyzed diaphragm. The latter may descend under high pressure to levels lower than before the phrenicectomy, but obliteration of the cavity continues unhindered.

Demonstration of the following cases is based on the roentgenographic evidence obtained in each case:

## CASE NO. 1

Reg. No. 53, fiscal year 1933, T.D., female, age 24 years.

FIGURE 1

November 16, 1931. Right upper-lobe cavity irregularly shaped. Transverse diameter approximately 2 cm., oblong 4 cm.

FIGURE 2

April 6, 1932. Pneumothorax approximately 5 months. Phrenicectomy done 3/25/32. There is no inward compression of the cavity but the obliteration is upward with the vertical diameter shortened 1 cm. from its hilar end. Diaphragm elevated 2½ cm. The basal effusion appears to be somewhat diminished. Pressure: minus 6, plus 1.

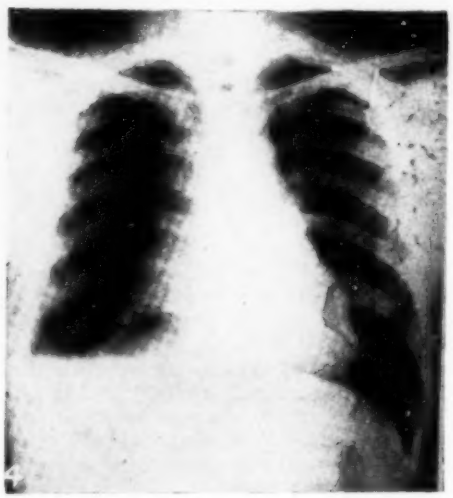

FIGURE 4

February 12, 1932. Pneumothorax 3 months. Cavity displaced inward and downward. Transverse diameter 3 cm.; oblong increased to 6 cm. Band adhesions from dome of chest to upper portion of cavity. It will be seen that the cavity has grown larger under pneumothorax treatment, being mainly elongated in the line connecting the attachment to the adhesion with the hilum. A small pleural effusion has occurred. Pressures at this time were minus 8, plus 1.

FIGURE 3

June 10, 1932. Pneumothorax approximately 7 months. Phrenicectomy approximately 3 months. Cavity is diminished upward and inward. Its vertical diameter is 2½ cm.; transverse 2 cm. Diaphragm depressed 1/2 cm. and appears lower than before induction of artificial pneumothorax. Pressure: plus 1, plus 4.

FIGURE 5

August 16, 1932. Pneumothorax approximately 9 months. Phrenicectomy approximately 5 months. Cavity is closed; diaphragm descended lower than in the preceding figure by 1 cm. lower than before induction of pneumothorax. Effusion is clearing and the pressure reading is plus 5, plus 8.

There is no ascent of the paralyzed diaphragm in this case to interfere with the lifting of the treated lung. Obviously, the elevation of the diaphragm is not responsible for the closure of the adherent cavity. It is the additional rest obtained by the treated lung which brings about mechanical changes for favorable molding of the cavity.

If the cavity walls are pulled by multiple adhesions in conflicting directions the process of obliterating it becomes more complicated and retarded, and it would seem that evidently the cavity closes in the direction leading to the attachment of the most resistant adhesion.

## CASE NO. 2

Reg. No. 271, fiscal year 1933, E.P., male, 23 years of age.

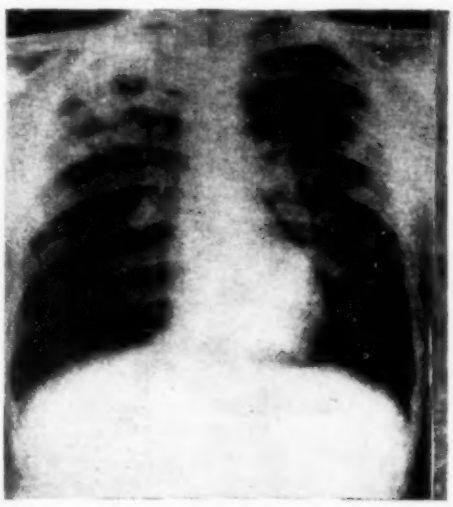

FIGURE 1

February 2, 1933. Shows right upper-lobe cavity situated midway between the mediastinum and the periphery of the chest, bound above by the clavicle and below by the second rib. Transverse diameter 2½ cm.; vertical 3½ cm. Small pleural effusion.

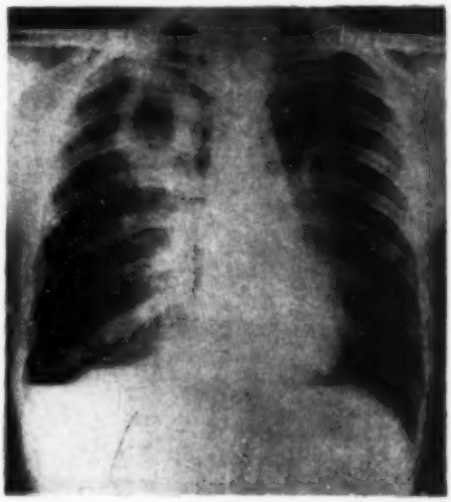

FIGURE 2

April 6, 1933. Pneumothorax approximately 2 months. Cavity receded downward and inward. The displacement is caused by the retraction of the upper-lobe toward the root and is made possible by the stretching of adhesions between the lateral chest wall and the upper-lateral aspect of the cavity. Both diameters are elongated, due to the stretching of the cavity downward and inward by the retracted upper-lobe. Transverse diameter 3 cm., vertical 4½ cm. Small pleural effusion. Pressure reading: minus 3, plus 2. Phrenicectomy done 6/7/33.

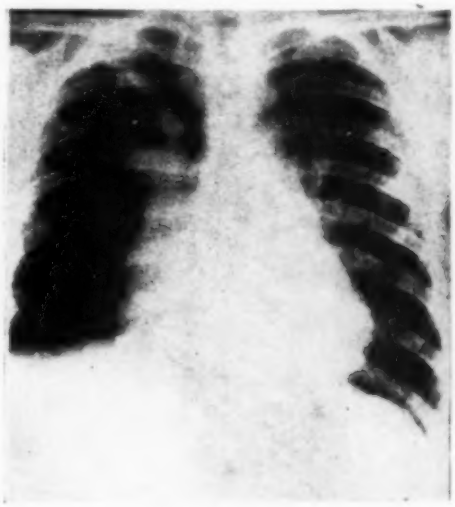

FIGURE 3

July 10, 1933. Pneumothorax approximately 5 months. Phrenicectomy approximately 1 month. Cavity obliterating upward and inward by retraction of its outer walls in those directions. Oblong diameter 4½ cm. It is being shortened from the hilar end. Transverse diameter 2½ cm. Length of adhesion unchanged. Diaphragm elevated 2 cm. Pleural effusion decreased. Pressure: minus 2, plus 7.

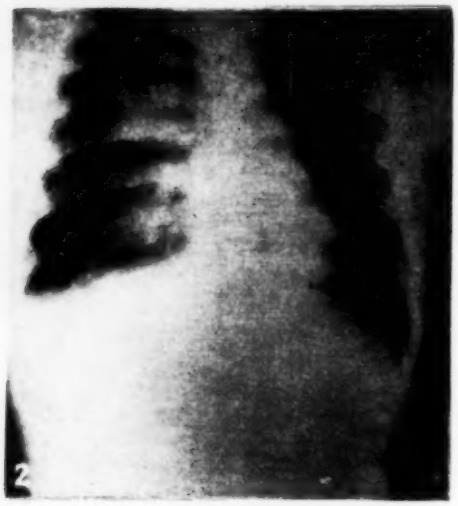

FIGURE 4

August 16, 1933. Pneumothorax approximately 6 months. Phrenicectomy approximately 2 months. Cavity obliterating upward. Oblong diameter only 2 cm. Transverse diameter unchanged. Diaphragm elevated approximately 4 cm. Pleural effusion at the same level. Pressure: minus 6, plus 4.

FIGURE 5

September 25, 1933. Pneumothorax approximately 7½ months. Phrenicectomy approximately 3 months. Diaphragm 2 cm. lower than on the previous plate. Cavity almost closed. Adhesions are exposed—mostly due to the retraction of the outer cavity wall. Pressure: minus 1½, plus 9.

FIGURE 6

October 12, 1933. Pneumothorax approximately 8 months. Phrenicectomy approximately 4 months. Cavity closed. Diaphragm elevated only 2½ cm. Pressure reading: minus 2, plus 6.

Thus with the diaphragm paralyzed increased pneumothorax pressures cause compression of the cavity from its hilar aspect toward the attachment to the adhesion. Prior to the phrenicectomy, raising the pressures resulted in pulling the cavity walls from the adhesions to the hilum end and brought about enlargement of the cavity.

The elevation of the paralyzed diaphragm in this case would suggest that the stump of the treated lung has been raised upward, causing relaxation of the adhesions. But, with the adhesions relaxed, its attachment to the cavity ceases to act as a fixed point. Compression of the cavity by the surrounding pneumothorax would then continue toward the only fixed point attached to the hilum, and the last portion to obliterate would be at the hilar aspect.

All the plates shown present the inspiratory phase with the paralyzed diaphragm in its highest position due to paradoxical movement while before paralysis the diaphragm is, during inspiration, in its lowest position. Raising of the paralyzed dome,

as shown by such a comparison, becomes, therefore, debatable.

To maintain the adherent cavity closed constancy of the intra-pleural pressure is essential. The proper pressure is determined in each case and maintained evenly by frequent refills. Pressures lower than the optimum lead to re-opening of the cavity. If the latter has remained collapsed about three months refills may be given at longer intervals.

It should be understood that the cavity is held closed by proper pneumothorax pressures and not by elevation of the paralyzed diaphragm. Successful closure of an adherent upper-lobe cavity is accomplished occasionally by a pleural effusion complicating pneumothorax. The factor leading to obliteration of the cavity in the presence of pleural effusion is probably temporary paralysis of the diaphragm caused by the involvement of the diaphragmatic pleura and constancy of the intra-pleural pressure, resulting from lessened absorption of injected air.

Diffusely adherent upper-lobe cavities do not recede from the chest wall with the induction of artificial pneumothorax; the injected air is prevented from surrounding the cavity walls and compressing them toward a fixed point. Obviously, paralysis of the diaphragm cannot improve the collapsibility of such cavities, but with the closure of the cavity expectoration generally ceases and the sputum becomes negative for tubercle bacilli.

## CONCLUSIONS

Upper-lobe cavities diffusely adherent to the chest wall are non-compressible under pneumothorax treatment alone. Cavities attached to the parietal pleura by fixed string and band adhesions can be compressed by pneumothorax combined with phrenicectomy. The explanation of the combined treatment is based on the fact that retraction of the compressed upper-lobe toward a fixed point is influenced by two counteracting forces: first, the tendency and tension of the lobe toward the root, and secondly, the contraction capacity of the stretched adhesion. While the diaphragm remains active tension toward the root dominates and the upper-lobe, suspended before two fixed points, continues to retract toward the hilum. The cavity is pulled from the attachment to the adhesion and the enlargement of the cavity and tearing of the treated lung may take place. Phrenicectomy is indicated as soon as such enlargement becomes appreciable. Following the paralysis of the diaphragm the tendency of the lung to retract toward the root or the hilum gradually diminishes. The contraction capacity of the stretched adhesions commences to prevail and the upper-lobe begins to retract toward its attachment to the adhesion. The raising of the paralyzed diaphragm seems to play no part in the obliteration of the cavity because cavities seem to close in the same manner, whether the diaphragm is raised, lowered or remains unchanged. This has been noted particularly in left-side cavitations which seem to close equally well, although the left diaphragm seldom rises to a high level. It would appear that several months are required for relaxation of the lung and closure of the cavity after a phrenicectomy, in contrast to the rapid closure obtained by cauterizing the holding adhesions by means of intra-pleural pneumolysis. It is assumed, of course, that the adhesions are accessible for cauterization, although x-ray evidence often fails to provide positive proof of this fact. The continuance of the cavity closure must be brought about by the maintenance of the proper pressure by refill.

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DISCUSSION—*Dr. G. S. Baxter*, Shawnee:

The surgical treatment of pulmonary tuberculosis has assumed a prominent place in the recent advances in general surgery. Surgical methods of increasing rest of the lung have been developed because of late diagnosis and inefficient treatment. It has come to stay, for it is daily prolonging and saving lives which otherwise could expect little from ordinary home and sanatoria regime.

Mechanical splinting of lungs has contributed to the statistics of cures an additional 36% to otherwise hopeless cases and has reduced the hospitalization of the sufferers to a very appreciable degree. Any method which offers a quicker restoration to tuberculous individuals to economical usefulness and the closure of an open case cannot be evaluated. Pulmonary tuberculosis can be successfully treated, and what is now needed is a technique to be developed to decrease mortality and enlarge indications for operative treatment.

It is generally admitted that any procedure designed to produce rest of diseased pulmonic tissue, close cavities and shorten the period of hospitalization is warranted. The old tabus and limitation

of mechanical treatment are about obsolete, and involvement of the contralateral lung no longer contraindicates therapeutic collapse. Bilateral collapse is gradually increasing, and but few unilateral cases are not suitable to some form of collapse therapy. The advocates of bed rest alone for indefinite periods of time, with resort to collapse therapy only when cavities and infiltrated pulmonary tissue have not shown satisfactory improvement, are fewer in number. Since bed rest is recognized as being not a method of attack but rather a method of resistance, it would seem reasonable in suitable cases to subject them to some form of surgical treatment and then advise bed rest as a secondary measure.

The simplicity and value of pneumothorax cannot be estimated. It is recognized as being the most useful and widely used measure of all collapse therapy. It has the dual advantage of being easily administered and readily discontinued. Phrenicectomy, which some observers claim results in 22% cures and still a greater percentage of cavitation cases rendered harmless to others, is simple, nonhazardous, and may be done outside the hospital. During these times of economic stress when hospitalization for long periods of time is prohibitive, pneumothorax or phrenicectomy combined with standardized rest and diet regime at home offer a ray of hope not hitherto experienced. Interruption of the phrenic nerve is a useful procedure for acute infiltrating lesions, in recent thin walled cavities, as an aid to pneumothorax when the base of the lung is uncollapsed and in adhesive cases where pneumothorax cannot be practiced.

Since the phrenic has important anastomoses with the great sympathetic, the effect of evulsion is no longer regarded as purely mechanical. It is obvious that in some cases of phrenicectomy where the diaphragm ascends only a few cm. the lung volume reduction would not be adequate to produce a closure of the cavity by mechanical compression, yet, in some mysterious way, the desired results are obtained. In certain early cases phrenic nerve operation will obviate the necessity for subsequent major operations.

It is always advisable to select and practice some form of selective collapse which will adequately and efficiently restore the pathologic lesion and at the same time save the good portion of the lung from obliteration.

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# HELIOTHERAPY AND PULMONARY TUBERCULOSIS*

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Heliotherapy has grown to be one of the helpful agencies that we have to offer in the treatment of those suffering from pulmonary tuberculosis. It has been developed through the ages, starting at least as far back as the time of Inknaton, the greatest of all sun worshipers. He was an Egyptian living some 3,000 years ago. Every ancient religion of which we have record is bound up, indissolubly, in the tenets of sun worship.

*Read before the Southeastern Oklahoma Medical Association at its meeting at Talihina, Oklahoma, on Tuesday, June 26, 1934.

Herodotus is perhaps the first who goes into detail concerning heliotherapy as a routine measure. Over 400 years before the Christian era, Herodotus, as quoted by Oribasius, wrote: "Exposure to the sun is especially indispensable to people requiring restoration and increase of musculature. One should take care that in winter, spring, and autumn the sun should have a direct access to the sick person; in summer and in case of feeble individuals, this method is to be avoided; the head is to be covered during the cure."

As far as the underlying principle is concerned, this might have been written yesterday. Herodotus chronicled that light was to be considered as both a prophylactic and a curative influence.

Others who have had a part in the use and development of this form of treatment include many names, a few of which will be mentioned with their outstanding contribution: Hippocrates (460-377 B. C.), it is said, was accustomed to prescribe sunbaths for his patients and traced the actions of sunlight. Antyleus (300 B. C.) laid down in detail the routine of the sunbath. Cicero and Pliny discovered the fact that leading citizens of Rome were accustomed to have solaria constructed in their homes; at the seashore, arenarias were provided for a complete exposure of the nude body. Cauvair in 1815 published a paper entitled "Les Bienfaits de l'insolation," in which he says: "Speaking of scrofulous infants, send them to the country, feed them up as well as possible, but above all, make them roast, burn, roast in the sun," Loebel (1815) lists as contra-indications, hemorrhage, congestions, stomach and bowel disturbances, acute inflammatory conditions and lung conditions associated with inflammation. In 1840 Ollier and Poncet of Lyons reported cases of tuberculous arthritis treated by sunlight.

The three individuals among others concerned with the further development of modern heliotherapy were Bernhard of Samaden; Rollier of Leysin, and Finsen of Copenhagen. Niels Reyberg Finsen, born of Icelandic parents, was graduated from the University of Copenhagen in 1890. He proved definitely that the actinic rays found in the blues and violets of the spectrum possess the curative and stimulating properties inherent in sunlight. In April, 1896, he founded his light institute at Copenhagen, and was particularly successful in treating the various types of skin tuberculosis. Finsen was the outstanding pioneer in the promotion of artificial heliotherapy in the same way that Rollier was the outstanding pioneer in the advancement of natural heliotherapy. Finsen used primarily the carbon arc lamp. He died in 1904.

In 1902 Bernhard used sunlight to treat a suppurating abdominal wound. He had noted that the Swiss butchers dried their meat in the sun; this observation and the success achieved by Finsen in employing artificial sunlight impelled Bernhard toward his sun treatment experiments. He subjected to the direct sunlight badly healing wounds, and later, cases of external tuberculosis.

Gauvain says, "Rollier is the 'High Priest' of the modern sun worship; he has led us back to sunshine and simplicity, to the first principles of light and life." Rollier, unaware of Bernhard's procedures, had opened his sanatorium at Leysin in 1903, and began his epoch-making work. The clinic was situated in the Alps of the Canton Vaud at a height of 1,300 meters (feet: 1421.4). It was the first clinic devoted exclusively to the systematic treatment of external tuberculosis by heliotherapy. At this altitude the air in the summer time is never oppressively hot; in winter the rather intense cold is counteracted by the continued brilliancy of the sun. The patients at the Rollier institution were given the benefit of cool fresh air, and of brilliant sunshine applied by means of sun-baths to the whole surface of the body.

Advance in mechanical apparatus has kept pace with the scientific progress in heliotherapy. From the first, the two distinct types of apparatus have been favored, the carbon arc lamp and the mercury vapor arc in vacuum. Some heliotherapists use the artificial source of light exclusively and some in combination with sun when sunlight is not available as on cloudy days. Kromayer invented the water-cooled vapor quartz lamp devised for local application.

A few words on the subject of physics are in order in a discussion of heliotherapy. Sir Oliver Lodge has defined light as "an electro-magnetic disturbance of the ether." Light consists of waves of varying lengths that travel in every direction from the point of propagation at a rate of 183,000 miles per second. When a beam of light is passed through a prism it is broken up into the colors of the rainbow. The colors—red, orange, yellow, green, blue, indigo, and violet, represent the visible spectrum.

This visible segment, however, constitutes by no means the entire electro-magnetic spectrum. Luckiesh, indeed, says that if the electro-magnetic spectrum could be projected as one view and the visible portion were one foot long, the entire spectrum would be seven million miles in length. The invisible spectrum, consequently, constitutes a most important phase of the radiant energy. At one end of the visible spectrum is found the infra-

red, consisting of wave lengths that grow longer and longer the farther we go beyond the visible red, to the Hertzian employed in both ultra-violet and diathermy. At the other end of the visible spectrum beyond violet, occur invisible ultra-violet rays that grow shorter and shorter the farther we go beyond the violet. At this end, still beyond the ultra-violet rays, occur the short x-ray and the gamma rays of radium, and finally, the Millikan cosmic rays recently described.

The units in which the rays are measured are the Angstrom unit, the millimicron, and the micron. The Angstrom unit —one ten-millionth part of a millimeter— is the unit generally used for the measurement of the waves of radiant energy. It is a wave length characteristic of the radiant energy just beyond the ultra-violet rays and approximately the wave length of the softest of the x-rays. It enables us to talk of x-ray in terms of tens, in ultra-violet radiation in figures approximating three thousands, and of visible light in figures up to about seven thousands.

The micron is the thousandth part of the millimeter, and millimicron is the millionth. Millimicrons are converted into Angstroms simply by adding another zero; for example, six thousand millimicrons equal sixty thousand Angstrom units.

We also have velocity and frequency to consider in speaking of radiant energy. The velocity is 183,000 miles per second while the frequency varies inversely as the wave length, the shorter the wave length the greater the frequency.

The long red rays have a comparatively small number of vibrations. The short ultra-violet has about six hundred trillion per second. It is perhaps to this factor, the very great frequency of the short actinic rays, that we must attribute the special chemical activity of the ultra-violet ray.

Composition of the visible and the invisible spectrum from the gamma region to infra-red:

TABULATION

| | Gamma Rays 1 Angstrom Unit | |
|---|---|---|
| Ultra-violet | 2,000 (extreme) | to 4,000 |
| Red | 6,200 | to 7,000 |

PHYSIOLOGICAL CONSIDERATION

We know, in a general way, that sunlight is essential both to the growth of plants and the growth of living organisms; that sunlight influences certain phases of metabolism; that sunlight has definite bactericidal qualities. We have learned from the work of Finsen and others that the different rays have different actions. The extremely long Hertzian rays are used for radio telegraphy, and the somewhat shorter infra-red rays, as their frequency increases, supply heat. We know that the range of visibility extends from wave length of 7,700 at the red end of the spectrum to a wave length of 3,900 Angstrom units at the violet end. Beyond the range of visibility we have the ultra-violet ray of high frequency which is germicidal, tonic, or toxic depending on the dosage.

If a patient is submitted to treatment of average doses of artificial sunlight erythema occurs in the irridated area after an interval of 5 to 8 hours. The erythema is usually accompanied by some pain. After a few hours the pain lessens and the erythema becomes dark and colored. These changes are accompanied by a sense of well being.

The area then becomes irritated and desquamation starts and continues for six or seven days. Following desquamation the part becomes pigmented or tanned; this pigmentation remains for varying periods of time and gradually disappears. This pigmentation is due to the ultra-violet ray and occurs with varying intensity and speed depending upon the amount and duration of exposure and on the quality of the skin. Blondes or redheaded individuals with fine textured skin do not pigment easily. They burn very readily unless precautions are taken. Brunettes, on the other hand, it is well known, take a beautiful coat of tan. This pigmentation acts as a protection. We will not go into the theories of the explanation of the physiological sequellae of irridation. Suffice it to say that there is the Cholesterol, the Dixon, the Nerve Stimulation, and the Direct Absorption theories put forth as an explanation of the results of irridation.

The general action resulting from the use of heliotherapy comprises a feeling of warmth, well being, exhiliration, and buoyance. Mental activity is enhanced and fatigue and depression tend to disappear. We have already mentioned its beneficial influence on metabolism which as a whole is stimulated. In the matter of calcium and phosphorus metabolism the influence is especially favorable, resulting in a def-

inite increase in absorption and deposition of these salts.

Some authorities claim that heliotherapy tends toward a speeding up of generalized endocrine function. The effect seems to be particularly prominent in the case of the thyroid and sex glands. The fact that menstruation appears earlier in girls in sunny climates is adverted to in attempting to establish the relationship of sun therapy to endocrine functions.

The effect on the blood of sun therapy includes an increase of calcium content and decrease of coagulation time, due undoubtedly to the increase of calcium.

As regards the cellular content, there is a tendency to an increase of the reds, and, according to some authorities, the lymphocytes also are increased. Sooy reports that the blood platelets are increased through artificial radiation. Occurrence of a leukocytosis is reported by most authorities.

Young rats fed on diets deficient in vitamin A and anti-rachitic substances are prone to develop rickets, xerophthalmia, infection of the ears, and cease to grow. Exposure to ultra-violet rays prevents the occurrence of rickets in such animals, causing them to grow at the normal rate, but does not prevent the occurrence of ophthalmia. Undoubtedly the actinic ray and the vitamin are closely bound up in the case of rickets. The relationship, howver, does not seem to prevail in the case of other deficiency diseases. Scurvy, beriberi, and other diseases may occur in the presence of adequate sunlight. In addition to its effect on vitamin D, ultra-violet radiation is supposed to enhance the action of the fat soluble vitamin A.

Bactericidal action of the actinic ray was definitely demonstrated by Robert Koch in 1890. Koch showed that the tubercle bacilli readily succumb to light. Bacilli, spread in thin films, are killed by direct sunlight in ten minutes. The chief bactericidal effect is allocated to the short waves of the far ultra-violet segment. The light affects not only the bacteria, but also their spores, products and secretions. The irridated tuberculin apparently loses its toxicity and is powerless to induce the intra-dermal reaction. Bactericidal spores are more susceptible to ultra-violet light than either to heat or chemicals; however, if a lethal dose is not administered the bacterial life may be stimulated.

Experiments have shown that sunlight has an invigorating effect on mentality. Everyone, child and adult, feels better in the sunshine. Even animals and birds show quite clearly their reaction of joyousness and well being toward solar radiation. Tests made in England in special schools for the psysically defective children showed that those at the Alton Institution, where heliotherapy was practiced, were mentally nearly a year in advance of children of similar age in a London institution, who had not received treatment.

The length of this paper will not allow me to compare the effects of natural with artificial sunshine,

## INDICATIONS

Heliotherapy should be used with great caution in the treatment of pulmonary tuberculosis. In the active tuberculous process of the exudative type particularly, great harm can be and is frequently done. In cases of fibroid tuberculosis with very little or no exudate, heliotherapy has been used with some success but here too only with very great caution.

Sunlight treatment, of course, should not take the place of usual routine treatment—rest, fresh air, diet and measures such as artificial pneumothorax, phrenicoexairesis, and thoracoplasty.

*Goldberg* has given as indications:

1. Pre-tuberculous individuals, particularly contacts, are frequently benefited by tonic treatment either with natural or artificial heliotherapy.

2. Early afebrile cases: The early afebrile or slightly febrile individuals of the fibroid type, with a sluggish apical lesion, is occasionally benefited.

3. Chronic fibroid tuberculosis: Some cases of chronic fibroid tuberculosis, which seem to be definitely blocked at a certain stage in their progress, are given the necessary added impetus toward improvement. Patients who have remained for years in a more or less stationary condition seem to be given, by heliotherapy, the slight added lift or pull which is necessary to get them ahead,

4. Pleural tuberculosis: Pleural tuberculosis, either serous or dry, reacts well either to artificial light or solar exposure.

5. Tuberculous empyema with sinus: This condition may be frequently helped considerably by irridation. The sinuses

seem to be helped greatly by the local treatment.

*Howson*, Carl R., says about indications for heliotherapy:

"Extra pulmonary lesions which are complicated by pulmonary involvement require the same care in their treatment as those cases which are pulmonary."

*Mayer*, Edgar, has to say:

"The most favorable response to solar exposures have been shown by the so-called pre-tuberculosis of children, and by the tuberculosis of the lymph nodes (including hilum), the pleura, bones, and joints, peritoneum, and intestines.

"Less favorable results are usually obtained in pulmonary, genito-urinary, laryngeal, ocular, aural, and cutaneous tuberculosis.

"In my own experience of ten years (paper, 1927), with the use of the quartz mercury vapor light as an adjuvant, the most favorable response has been encountered in intestinal tuberculosis."

He also lists as responsive to radiation with mercury quartz vapor lamp, "hilum glandular tuberculosis" of children and adults.

*Rollier*, A., gives: "The types that derive the greatest benefit from heliotherapy are, in diminishing order: 1, post pleuritic types; 2, fibroid types; 3, chronic bronchial types, especially when superficial; 4, the scattered type; 5, the type with stationary cavity; 6, the spleno-pneumonic type of Gaucher."

*LoGrasso*, Horace, says that "in cases other than those with marked activity, those with generalized tuberculosis, or those while having hemorrhages (and until two or three weeks thereafter) are indicated for heliotherapy."

*Watson* gives: "Childhood (primary complex) lymphatic and tracheo-bronchial, adult (tissue) and selected cases of fibroid tuberculosis."

*Bach* gives: "In all but the progressive, exudative and destructive stages of pulmonary tuberculosis."

*Weinbren* gives: "Treatment may be safely given provided there is little evidence of breaking down of lung tissue."

*Kirkwood* gives: "In any fibroid or nodose pulmonary lesion which shows little or no perifocal reaction and which is not complicated by arteriosclerosis, hypertension or uncompensated cardiac disease."

*Cooper* and *Laird* both thought heliotherapy was of most use in cases which showed a tendency to fibrosis.

For laryngeal tuberculosis most authorities advise a combination of general and local exposure. Local exposure is carried out by means of reflected light or by direct irridation through means of fused quartz applicators attached to the Kromayer water-cooled mercury quartz lamp. In this way irridations by the Kromayer water-cooled mercury quartz lamp are started at thirty seconds and gradually increased by one-fourth to two minutes at each exposure twice a week up to fifteen minutes.

Mayer practiced local irridation twice a week, using reflectors, starting at two minute periods and gradually increasing up to forty-five minutes.

Dr. Alexius Forster has perfected a series of mirrors by means of which sunlight is reflected into the throat. Exposures of thirty seconds gradually increasing up to about twenty minutes once or twice a day is used. Excellent results have been obtained in the relief of pain.

Tuberculosis of the eye has been treated by direct exposure to ultra-violet rays by some without apparent harm. Others recommend that light filters or closed lids be interposed between eye and source of ultra-violet rays.

Artificial heliotherapy seems quite effective in treatment of tuberculosis of the glands. The dosage must be carefully regulated using general as well as local irridation. Natural heliotherapy seems to be preferred in this condition, however.

In tuberculous peritonitis with proper care and conscientious supervision the results obtained from irridation of sunlight are quite encouraging. The exudative form of peritonitis responds especially well. Large exudates, particularly, disappear after five or six weeks. The fibro-adhesive form also responds well.

Intestinal tuberculosis, including tuberculous tumors in the ileocecal region, improve markedly under irridation to sunlight. However, Mayer, among others, reports that better results are obtained from the use of the mercury vapor lamp. The ileocoecal tumor rapidly disappears and the intestinal symptoms, flatulence, dis-

comfort after eating, pain and diarrhea, also disappear.

*Howson* gives as *contra-indications* to heliotherapy:

1. Acute tuberculosis of all types.

2. Acute stage of chronic tuberculosis in chronic types with much fever.

3. Those who have recently had hemorrhages.

4. Those who burn but do not tan.

5. The aged and those whose vitality is so depressed that they are unable to react.

*Crockett* gives the following contra-indications:

1. Cases of progressive disease anywhere.

2. Cases showing marked and progressive tissue destruction.

3. Cases with toxic manifestations, e. g., amyloid disease or cochexia.

4. Cases which show pyrexia due to sepsis.

5. Cases of hyperthyroidism.

*Weinbren* is emphatic that not the extent of the disease but the state of activity is the guide, and that there is no single contra-indicating factor if the cases are selected along these lines. A high degree of toxemia is probably the most suggestive factor.

*Laird* thinks that the treatment is very little more dangerous in active cases than in the afebrile cases for which he recommends it, but he admits that in the acute cases the treatment is not likely to prove of much value.

*Gahwyler* gives the following contra-indications:

1. Exudative pulmonary processes.

2. All pneumonic or broncho-pneumonic cases.

3. High fever.

4. A tendency to hemorrhage.

5. All cases which are inclined to be progressive and which show a rise of temperature after the slightest irridation.

6. All cases of toxic manifestations, intestinal or cardiac.

*Wurtzen* of Copenhagen holds views which are much opposed to any of the above. He says that there are no contra-indications to this form of treatment; it is all a question of dosage. In his cases the treatment is abandoned only when the patient is too ill to go to the light room.

*Watson*, S. H., gives:

1. Severe forms of heart disease.

2. Arteriosclerosis.

3. Nephritis where not of tuberculous origin.

4. Temperature of more than 102 degrees F. (rectally). (Omit light bath for a day or two.)

5. Go slow when patient is ill.

6. All exudative pulmonary forms in adults.

*LoGrassa*, Horace, and *Balderry*, give:

1. Progressive pulmonary lesions with high fever and rapid pulse.

2. Insomnia.

3. Hyperthyroidism and obesity, particularly when present in patients with valvular heart disease.

4. Marked activity.

5. Generalized tuberculosis.

6. Hemoptysis (until two or three weeks after stopped).

*Mayer*, Edgar, has to say about contra-indications:

"It is highly probable that, in most forms of progressive acute tuberculosis, light therapy is not indicated. In my experience, intestinal tuberculosis is an exception. In this complication at times, even when progressively active, mercury quartz light has proved of great value."

*Roland Davidson*, Tucson, Ariz., 1928, said in discussion of a paper on heliotherapy by Dr. Howson, that "At the Desert Sanatorium we no longer admit patients with the open form of pulmonary tuberculosis for we found only a small number of patients with this type of tuberculosis benefit by treatment with solar radiation at this particular place, though most careful supervision was exercised, and care taken to prevent excessive radiation."

*Untoward Symptoms Given by LoGrasso and Balderry:*

1. Hemoptysis—

Jacquerod who has discontinued the use of heliotherapy in pulmonary tuberculosis, found this complication occurring.

Bacmeister attributes its occurrence to radiations.

Pottenger, Holmboe and Morin hold that

heliotherapy does not produce hemoptysis. Morin observes that in those with previous histories of hemorrhage it did not recur with exposure to light.

2. An increase in the activity of the lesion or the reactivation of one which has been arrested, has been observed by Jacquerod and Bacmeister.

3. Temperature and pulse rate have often been found to rise sharply.

4. Headache, insomnia, palpitation, anemia, anorexia, and hysteria have also been mentioned.

Many use Rollier's technique or a modification of it in giving solar radiation. He states that heliotherapy must be applied to the whole surface of the skin always having it as a decongestive agent. This decongestion is accomplished by beginning and ending the general exposure with the lower extremities, whatever the seat of the lesion under treatment. This allows one to gain information regarding the patient's degree of tolerance upon these "neutral" parts and to induce in them a call for blood, whose action involves in turn a decongestion both of the bone and joint foci, and of the abdominal and even the thoracic viscera.

"Heliotherapy must then be administered progressively in short exposures, with the object of accustoming the skin and producing the pigmentation indispensable for the skin's defensive functions, while avoiding solar erythema and its troublesome consequences. This procedure must be modified according to the state of resistance of the patient and the reaction observed. The patient's subjective sensations ought always to be taken into consideration and the rational application of the sun-bath should produce a sensation of well being—never fatigue or lassitude.

"After the lower part of the body has become well pigmented and the patient has been carried on a period occupying from a few weeks to three or four months, the chest (this in cases of surgical tuberculosis complicated with pulmonary tuberculosis) in turn is uncovered. It is necessary to proceed minute by minute, exposing alternately the front and back; exposures should be separated by an interval of rest in the shade.

"Prudence pushed to an extreme renders accidents exceptional. Commencing pigmentation on the skin of the chest marks the most critical period. There is no object in exposing to general solar radiation more than one and one-half hours to two hours daily,"

Do not take sun-baths one hour before nor until two hours after a heavy meal. In this climate in mid-summer the early morning and later afternoon sun are used as it is usually too hot between 10:00 A.M. and 3:00 P.M.

*Roland Davidson* has to say about exposure of the chest of those having pulmonary tuberculosis: "Our clinical experience does not justify covering the chest of patients with pulmonary disease. Unquestionably a greater effect is obtained from a fractional dosage than is obtained from a single long exposure although the reason for this difference has not definitely been shown."

*Howson* writes: "When definite evidence of tanning is seen then, and not until then, the chest may be cautiously exposed, beginning with one minute daily until the time of exposure equals that of the rest of the body, the exposure time of which has not in the meantime been increased.

"Any patient who feels worse after a bath than before has had too much sun. The use of artificial light is reserved for the days on which it is not possible to use the sun."

*Coblentz* says that the general dosage procedure is empirical, based on the attending physician's general experience, and on the reaction of the particular patient undergoing treatment.

*Gauvain* says: "Sun treatment is not mere exposure to the sun. The technique requires skill, care and gradual application."

*Herve'* and *Roussel*, using Rollier's technique, practiced systematically the sun cure of patients having pulmonary tuberculosis in their sanatorium, conclude: "Heliotherapy only disappoints those who do not give enough attention to it."

Most patients, before receiving the first sun-bath, need to be inured to out-of-door life. This is accomplished by giving the air-bath out on an open porch where the patient is protected from the sun and cold wind. As a simple method one may use the same procedure as used for taking the sun-bath, adjusting the time of exposure according to the reaction of the patient.

Before starting the air-baths and sun-baths the temperature, pulse, and blood

pressure should be taken; a blood count and urinalysis together with the usual physical examination, x-ray picture and other laboratory procedures should be done. There should be protection against cold wind, not ever allowing the patient to become chilled.

The head is protected from the sun by means of some covering which will reflect, not absorb, the light. Some white material made into a covering for the head such as a white linen hat is favorably mentioned for this purpose.

LoGrasso of Perrysburg, New York, gives as their modification of Rollier's technique of sun-baths the following:

"*First Day:* The patient, reclining on a bed and dressed only in trunks and with head and eyes protected, is taken to the sun porch where neither glass nor screen comes between the patient and the sun. His body is covered with sheets or blankets down to the feet, which are exposed and irridated for periods of five minutes three times during the day with intervals of about an hour.

"*Second Day:* Each insolation period of the feet is increased to ten minutes, and during the last five minutes of each period the sheets are drawn back to the knees, thus giving the feet ten minutes and the legs from ankle to knee three five minute exposures.

"*Third Day:* The feet are irridated for fifteen minutes at each period. The insolation time of the part from ankle to knee is increased to ten minutes, and during the last five minutes the thighs are exposed and insolated.

"*Fourth Day:* Each of the three insolation periods is as follows: feet, 20 minutes; ankles to knees, 15 minutes; thighs, 10 minutes; abdomen, 5 minutes.

"*Fifth Day:* Each insolation period of each part previously irridated is increased by five minutes, and the chest receives its initial exposure of five minutes each period.

"This daily increase in the length of the irridation periods is kept up until on the twelfth day the longest-exposed part receives a total of three hours, the exposure periods being: for the feet, 60 minutes; ankles to knees, 55 minutes; thighs, 50 minutes; abdomen, 45 minutes, and chest, 40 minutes. From this day on to the sixteenth, the insolation period of the feet remains 60 minutes, while that of the other parts keeps increasing at the same rate until the 60-minute limit is reached by each one in turn.

"On the seventeenth day the change is made from three 60-minute periods to two 90-minute periods, one in the morning and one in the afternoon. The anterior and posterior surfaces should, if possible, receive the same amount of irridation, the total exposure being divided equally between the two surfaces. The arms are exposed along with the rest of the body, allowing them to lie along the side of the body."

Here at the Eastern Oklahoma Tuberculosis Sanatorium we have obtained favorable results from heliotherapy. This spring some sixty children were started on solar irridation, some of whom had irridation with the mercury vapor lamp during the winter months. Also some of the adults are using this form of treatment. As for specific results it is of course too early to give any reliable data.

This form of treatment has a most beneficial psychic effect on those using it. The patients using solar irridation have a more hopeful outlook on life, which, as all those working with tuberculous patients know, is a great factor in obtaining an arrest of their disease.

Supervision of patients taking the sun-bath or those receiving artificial heliotherapy should be done by the physician himself and not left to a nurse or attendant.

*Samuel H. Watson* has prepared a sun chart for use of patients taking heliotherapy which takes into account the untoward as well as the beneficial effects resulting from each sun-bath. In case untoward symptoms occur in spite of the conscientious supervision of the physician the irridation should be discontinued for a few days. When again started the time of exposure is never as much as it was before the irridation was stopped, but is started at say about half as much, and then more cautiously increase the time of exposure to that tolerated by that particular patient.

SUMMARY

1. The history of heliotherapy is interesting, going back as far as Inknaton, 3,000 B. C.

2. Mechanical apparatuses used for artificial heliotherapy have been developed into effective appliances to be used alone or in conjunction with solar irridation.

3. The physics of light has given to us

the physical components which go to make up the visible and invisible parts of the spectrum, leaving only a small segment not worked out.

4. The invisible part of the spectrum, especially the ultra-violet rays, is that part to which is attributed mainly the therapeutic results obtained in heliotherapy.

5. The rays are measured in units: Angstroms, millimicrons, and microns.

6. The physiological effects have not been definitely proved; an attempt has been made in the Cholesterol, the Dixon, the Nerve Stimulation, and the Direct Absorption "theories".

7. The general action resulting from the use of heliotherapy includes that of warmth, well being, exhiliration, buoyancy, mental activity enhanced, and other more specific effects.

8. The indications for heliotherapy vary according to the views of the different ones giving their opinions. The contra-indications follow the same trend.

9. Most authors think irridation is indicated in childhood type of pulmonary tuberculosis, glandular, intestinal, laryngeal, fibroid type of pulmonary tuberculosis while inactive, pleural type, and tuberculous empyema.

10. In general, the majority of workers among the tuberculous seem to agree on the contra-indications as follows: Active progressive disease, exudative pulmonary processes, cases showing marked toxic manifestations, marked debilitation, hyperthyroidism, arteriosclerosis, heart disease of any moment, high fever, and hemoptysis (for some time after cessation).

11. Modifications of the principles of Rollier's technique are used by most workers using heliotherapy. It is, briefly, use of prudence, gradual exposure of the body first to air and then to sun, the rapidity of progress in exposure depending upon the subjective and objective reactions of each individual patient, having always the head covered, and protection from chilliness.

12. Exposure of the chest to irridations in pulmonary tuberculosis is done but the conservative physicians do it very slowly and after the rest of the body has become well pigmented.

13. Heliotherapy treatment should be directly supervised by the physician himself, remembering that Gauvain says, "Sun treatment is not mere exposure to the sun. The technique requires skill, care, and gradual application."

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# CHRONIC HYDROCEPHALUS FOLLOWING AMPUTATION OF MENINGOCELE: OBSERVATIONS TWELVE YEARS AFTER OPERATION

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It is well known through experience that congenital hydrocephalus occurs frequently in conjunction with other developmental anomalies, especially spina bifida, meningocele and meningo-encephalocele or meningo-myelocele. The presence of manifest or potential hydrocephalus in conjunction with meningocele is of such high incidence (the latter seeming to serve a decompressing function), that the removal of a meningocele has long been known to be attended by a danger of death from acute hydrocephalus almost as grave as the hazard implicit in a persistent meningocele.

The following case is presented because of the unusually long survival period following simple amputation of a meningocele, and because the hydrocephalus which followed this amputation is accompanied by an interesting clinical syndrome whose chief features are endocrinopathy, epilepsy, and an absence of evident intellectual defect:

S. P. K., a female, was born May 7, 1922. The child's mother had had two miscarriages and a third child lived only 36 hours. The patient was born at term of the fourth pregnancy. The mother was 32, in good health. The father was 39, in good health. Immediately after birth a protuberance in the occipital region was observed and a neurologic consultation requested. Dr. Karl A. Menninger saw the patient at 6 hours and described the sac as of small hen's egg size, attached by a small pedicle just below the occipital protuberance. As nearly as the examiner could judge, the meningocele emerged between the atlas and axis. There was no bony deformity. The sac was covered by skin which was hairless except in a few spots, and it was eroded superficially where it joined the skin over the occipital region. Pressure on the head or fontanelles caused dilation of the meningocele. Pressure on the sac caused the child to cry. Removal of the sac was advised, and this was executed by Drs. W. M. Mills and M. Sloo of Topeka on May 8, 1922, when the child was 32 hours old. (See Fig. 1 for sac.) No unusual enlargement of the head is mentioned in the original description.

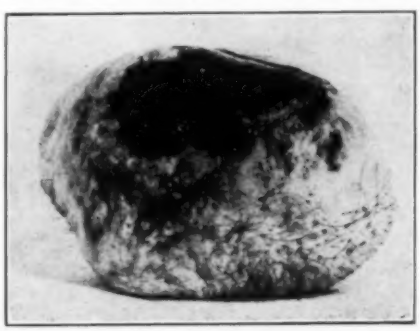

FIGURE I.

A note from the family physician states that the baby did very well for one week after leaving the hospital. At the age of 3 weeks the child began to cry and cried continuously for 36 hours. She developed a marked strabismus (type not mentioned) and her hands and feet jerked. (The physician notes "no definite convulsion".) There was no vomiting. Circumference of the head at this time was 15¾ inches. The child became quiet under bromide medication.

A note from the surgeon in response to a letter of October 1, 1924, stated that the "baby is progressing well but has a moderate hydrocephalus". From this time the patient was not under frequent medical observation (to our knowledge) until her tenth year. It is known, however, that her tonsils were removed when she was three years old. She entered school at the usual age and did excellent work, securing "A's" consistently in all subjects except arithmetic. She was disinclined to play with other children and was spoiled by her excessively solicitous mother. It was learned later that the child's head ceased to grow perceptibly after her second year.

On February 23, 1932, at the age of 9½ years, the patient was referred to the Menninger Clinic by Dr. T. A. O'Connor of Topeka. About five weeks before, the child had suddenly ceased to play and placed her hand on her stomach, staring into space. She then tried to vomit. In a few minutes she felt "fine" and resumed her play. Similar attacks recurred a few times a day, occasionally following an interval of two to three days. On February 7th the patient became ill with influenza and she had a generalized clonic convulsion the same evening. Major convulsions did not recur but the patient continued to have petit mal spells almost daily. There was no history of headache except one following influenza, and there were no other subjective complaints. It was observed by the mother that the child's breasts were overdeveloped and asymmetrical and that pubic hair was beginning to appear.

**Physical Examination**: The child was 4 feet 9⅜ inches in height. She was distinctly obese, her weight being 109 pounds (overweight 25 pounds). The adipose tissue was most evident about the pelvic girdle. Her head was of typical hydrocephalic configuration, the circumference 24¼ inches. An old occipital 24½ inches operative scar was present. There was a

suggestion of exophthalmic stare. Joints were hypotonic. Fingers tapered markedly. There was a distinct genu valgum. The breasts were excessively well developed, the right larger than the left, and there was a moderate amount of hair on the mons veneris.

**Neurological Examination:** A slight left external rectus weakness was evident, and the right naso-labial fold was shallower than the left. Gait was broad-based with difficulty in walking a straight line. The Romberg was positive. All deep reflexes were hyperactive.

**Laboratory:** Hemaglobin 83%, red blood count 4,620,000, white blood count 9,000; neutrophiles 72%, small lymphocytes 22%; large lmyhpcytes 3%; eosinophiles 2%; transitionals 1%. Blood Wassermann negative. Urine negative. Mother's blood Wassermann negative.

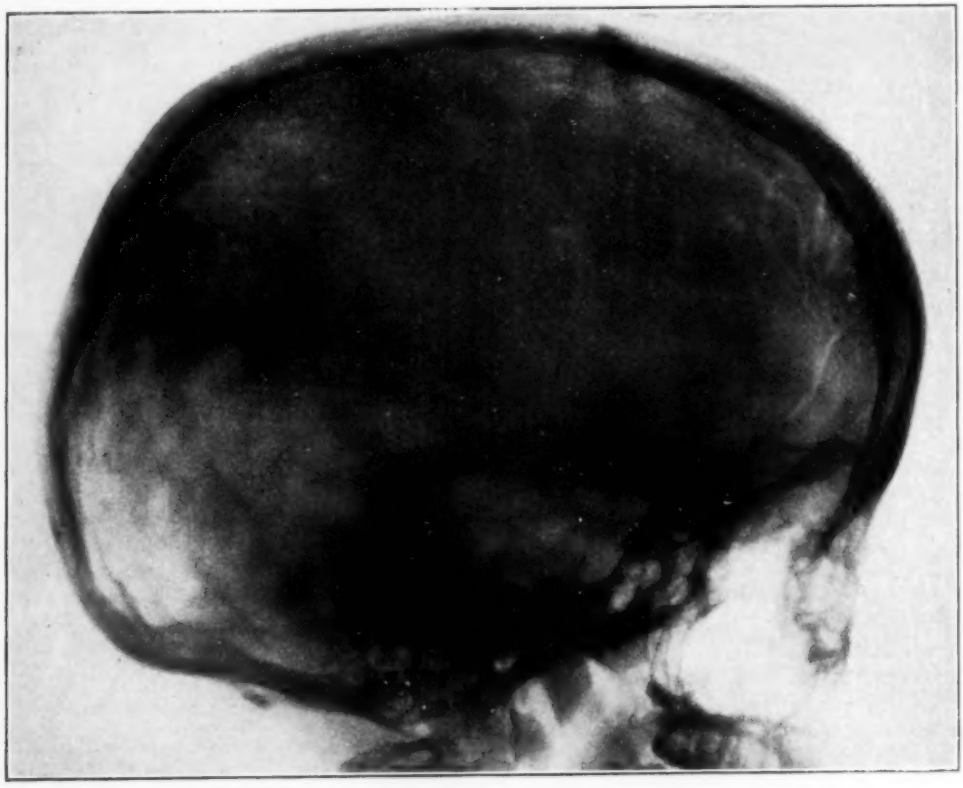

FIGURE II.

**X-Ray:** (See Fig 2) Head, lateral view, right side to film, skull markedly larger and thicker than normal. Marked osteoporosis of frontal and parietal regions. Marked irregularity in density of bone shadow in occipital region and also just above base line of skull. (Pressure digitations.) Shadow of blood vessel in frontal region unusually prominent. Sella turcica shallow but not occluded. Posterior clinoid process inclined anteriorly. Mastoid cells clear. Frontal sinus very shallow. Numerous tooth buds visible. The spinous processes of the first two cervical vertebrae are apparently bifid.

At this time it was felt that the hydrocephalus was sufficiently well "compensated" to exclude the consideration of a radical attack on this problem. The patient's petit mal seizures, her obvious obesity and other manifestations of endocrinopathy were made the objects of therapeutic attacks. Small doses of luminal were administered, a "reducing" diet was ordered, and fluid intake was restricted to one pint a day. In addition the child began to receive small increasing doses of whole gland pituitary extract subcutaneously. The effect of this treatment was at first dramatic. After two months of treatment the child entered a period of about seven months during which she was entirely free from "spells". When the medication was discontinued the effect was carried over for a month, but the attacks then returned. The treatment was reinstated but the child continued to have petit mal attacks, irregularly every three to ten days regardless of variation in the dosage. Whether an inhibitory factor arose in response to the medication at this time or the persistent seizures were due to laxity in diet and fluid consumption, cannot of course be stated with certainty. This treatment was discontinued on November 15, 1933. The remainder of the regimen was continued as before with the addition of a diuretic in the form of ammonium chloride.

The child's neurological status was reviewed from time to time. On February 20, 1933, the findings were as follows: The margins of the left optic disk were slightly hazy, but there was no elevation. Visual acuity was severely diminished on the left. A slight degree of external rectus weakness was present bilaterally, more severe on the left. There was some flattening of the right lower face. Gait was broad-based and there were slight bilateral disturbances of

coordination, more marked on the right. Tendon reflexes were increased in the right upper extremity and left lower extremity. There was exhaustible right ankle clonus. The findings have fluctuated in intensity from time to time but no essential persistent change has occurred up to the present.

On January 6, 1934, the child's mother gave her camphorated oil by mistake instead of castor oil. Her cheeks were flushed and her temperature slightly elevated. There were no other ill effects. She was admittd to the sanitarium for 24 hours and eliminative therapy was given resulting in the disappearance of her symptoms. The incidence of the child's spells had not changed since her last visit.

In March, 1934, the patient contracted whooping cough which lasted until the end of April. In the latter part of May she began to have attacks almost every day, preceded by a cry but unattended by convulsive movements or falling. Her mother had discontinued the administration of the diuretic but had continued to give her luminal. She was brought to the clinic at our request on August 9, 1934. No objective change was discerned except that the child seemed worn out by the intense and persistent heat of the summer. The x-ray of the skull was identical with that made over two years before. Despite her petit mal seizures and the attack of whooping cough she had been promoted in school. At this time a ketogenic diet and the resumption of endocrine therapy were proposed. The parents refused consent for lumbar puncture or ventriculography, but consented to consider the former.

(Later additional data: 12/27/34. BMR-25. Glucose tolerance: Fasting 105. One-half hour 268. One hour 286. Two hours 182. Three hours 115. 2/23/35: BMR-27%. Following this determination the patient began to receive small increasing doses of dried thyroid gland.)

## DISCUSSION

Certain interesting features which this case presents may now be discussed separately.

1. *The operation and its complications:* Regardless of the type of meningocele the amputation of such a lesion is always fraught with grave danger. If the child does not die of shock, cerebrospinal fluid leakage, or meningitis, death often results from acute hydrocephalus. Cutler[1] and Penfield and Cone[2] mention the fact that Milton in 1892 observed the frequent association of spina bifida with hydrocephalus and warned against the use of the "knife" for meningocele. It is a matter of clinical observation that the meningocele acts as a safety valve for the hydrocephalus, and increased intracranial pressure has even been included among the possible primary causes of the meningoceles and related herniations. (See Cutler[3] and Babonneix[3].) Regarding the classical procedure of simple amputation, the opinions of surgeons of experience vary considerably as to the indications, the hazards, and the optimum time for operation. (Cutler[1] and Penfield and Cone[2]), although all agree that the operation must be undertaken if the condition of the sac is such that rupture or infection are threatened.

Cutler[1], who made a careful statistical analysis of 39 cases, came to a pessimistic conclusion regarding the efficacy of operation, feeling that the operation attacked an effect rather than its cause, and Bailey, in discussing this paper, felt that the operation was irrational, that the hydrocephalus should be attacked first, unless the condition of the meningocele made operation imperative. In response to increasing awareness of the inadequacy of the usual operative procedures, Penfield and Cone[2] devised an operation which took into account the necessity for preserving the absorptive function of the meningocele sac. They demonstrated this by histologic and experimental methods, showing the similarity of the sac tissue to the arachnoid villi in the cranial meninges. The operation consisted essentially of the evacuation of the sac which was, however, preserved and collapsed beneath a fascial tent. The mechanical decompressive function of the sac is, of course, lost, but the authors report excellent results, and the operation may prove to be an escape from the hazards of the older procedures.

Gross and Sachs[4], after reviewing their large experience, have recently questioned the justification for the pessimistic attitude toward the amputation procedure, when careful indications are followed and preoperative treatment for ulcerated sacs is employed. They do not feel that the incidence of hydrocephalus is related to the type of closure employed.

In view of the hazards involved, the long survival period of this patient (twelve years at present) must be emphasized. The operation was a simple amputation performed in one stage, and the child did develop an acute hydrocephalus following the operation, manifested by jerking of the extremities, acute extra-ocular muscle weakness, and subsequent enlargement of her head. That some compensatory mechanism supervened is indicated by the cessation of growth of the head and the child's freedom from striking symptoms for many years. Whether a proportionate decrease in the secretion of cerebro-spinal fluid or the partial penetration of an original obstruction in the cerebral subarachnoid space occurred cannot be said. The latter would be the hypothesis most compatible with Dandy's[5] theory of the cause of "so-called idiopathic hydrocephalus". It is true that hydrocephalics may

live on to senility in some instances, but these are rarely patients who have had striking manifestations of acutely increased intracranial pressure early in life. We do not know what has been the longest survival period in a case of hydrocephalus following removal of a meningocele. Fulcher[6] stresses the exceptional nature of prolonged survival after such operations in recording the survival of an infant a few months after the single stage amputation of a suboccipital meningocele.

2. *The onset of epilepsy:* Convulsive seizures are frequently associated with hydrocephalus, as they are with Little's disease and other congenital disturbances. One might generalize to the extent of saying that they are common in any condition where cortical inhibitory control is vitiated, whether the mechanism be increased intracranial pressure or a cerebral degenerative process. The convulsive seizure may be delayed in their appearance until long after the primary disease manifests itself. This patient suffered a petit mal seizure in her tenth year following the onset of hydrocephalus. It is possible that a low grade infectious process reactivated her hydrocephalus. If this were true it would still remain unsettled whether the infection caused increased choroid plexus transudation, further adhesions in the arachnoid, or both. It is noteworthy that the child's second major convulsion occurred with a manifest "influenza" and that her last exacerbation followed whooping cough. One can only speculate as to whether or not there is a "diencephalic" element in this child's petit mal spells, a possibility suggested by their original visceral nature and the apparent although short-lived response to endocrine therapy. In the last year or more the attacks have taken the form of brief accessions of dizziness and more recently they have been preceded by an involuntary cry.

3. *The endocrinopathy:* The child exhibited precocious development of her breasts and pubic hair, both being apparent to a medical examiner before the completion of her tenth year. (Figure III, a recent photograph, exhibits the over-development and asymmetry of the breasts, which have not grown perceptibly the last two or three years.) Both phenomena had been noted by her mother some time before examination. In addition, there were pudgy hypotonic hands with tapering fingers and a conspicuous obesity. The child has not menstruated to date. While endocrinopathies associated with chronic hydrocephalus are not widely appreciated, they have been described frequently in the literature. Oppenheim[7] in his textbook mentions the premature appearance of menses and puberty in hydrocephalus, observed by Bourneville-Noir. Pollock[8] described hypopituitarism associated with hydrocephalus. In an interesting postmortem specimen he could not ascribe the clinical syndrome exclusively to the pituitary because the pineal body was also compromised. This author also mentioned the clinical observations of endocrinopathy with hydrocephalus by many earlier neurologists, including changes in the sella turcica. Cushing[9] described several endocrine syndromes mostly in connection with obstructive hydrocephalus, including a case of acromegaly. He stated that the paradoxical combination of obesity with genital hyperplasia is possible although not common and remarked on the frequency of adiposity and other vegetative disturbances in young hydrocephalics. Cushing found evidences of direct pressure on the pituitary body in his cases but thought that obstruction to the circulation of pituitrin in the cerebrospinal fluid was also a factor. Babonneix[9], Babonneix and Denoyelle[10], and Bonnet, Babonneix and Carrette[11] present cases

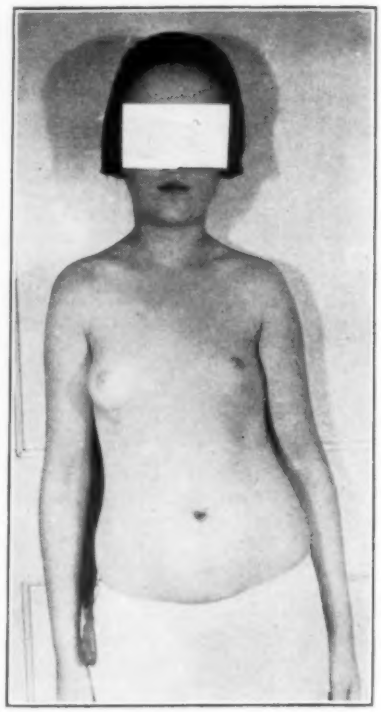

FIGURE III.

of mixed metabolic and growth disorders with hydrocephalus, and discuss the mechanisms involved. Babonneix and Denoyelle[6] favor the hypothesis that the endocrinopathic phenomena are due to involvement of the tuber cinereum and infundibulum, and cite instances in which the hypophysis was normal at necropsy. It is obvious that either mechanism might be invoked by the conspicuous stretching of the floor of the third ventricle, especially in the tuber region. These authors also seek to explain the frequent non-occurrence of adiposity or similar disturbance by the absence of dilatation of the third ventricle, for instance in those cases where the foramina of Monro are blocked, causing dilatation of the lateral ventricles alone. Besta[12] describes three interesting clinical syndromes in adults, including sexual infantilism, hypersomnia, and psychosis, with definite x-ray evidences of hydrocephalus, cured by radiotherapy. Cardenas[13] describes two cases of precocious genital development in children with hydrocepahlus. Many other instances may be found in the literature, but these suffice to indicate the variety of hypophyseal, tubero-infundibular, and (questionably) pineal syndromes which may be associated with hydrocephalus and are in all probability due to it. It is possible that many obscure endocrinopathies would be found on closer scrutiny to be due to low grade hydrocephalus.

4. *The patient's mental state:* The association of hydrocephalus with mental inferiority or progressive mental deterioration is very well known. This association, however, is not always the case. Oppenheim[7] states that there are not a few cases in which the intelligence is normal and mentions that in mild forms the disease may be associated with exceptional ability, especially artistic ability (quoting Perls). Wechsler[11] states that the mentality is sometimes normal and rarely, with mild degrees of hydrocephalus, even supernormal. Babonneix mentions as probable "frustrate" hydrocephalics the physicist and physician, Helmholtz, the pianist, Rubinstein, and the poet, Verlaine. It is perhaps more rational to assume that intellectual superiority occurs in these cases in spite of increased intracranial pressure rather than because of it. However, our knowledge of psychophysiology is still so scanty that we cannot be certain that the milder degrees of pressure may not in some instances have a stimulating effect on some cortical functions.

This child had always impressed everyone who had contact with her as "precocious". She was alert, cooperative, and her vocabulary was large. She seemed to have an unusual degree of insight into her troubles and to be genuinely philosophical about them. Her progress was satisfactory in a parochial school. When last seen at the clinic she had been promoted to the seventh grade with an average of "90", and had been awarded a prize for excellence in catechism. At this time a psychometric test was performed with the following results (Stanford Revision of Binet-Simon): Age 12 3/12 years; mental age 11 1/2 years. Comments: Attention good. Interest well sustained. Vocabulary good. Calculation fair. Reasoning slightly defective. Association somewhat slow. Level about average. The performance tests were all poorly executed. The quantitative test thus failed to substantiate a clinical impression. However, the child remains unusually alert and capable, despite her severe organic burden, and she does have a remarkably well developed faculty of speech. Her memory, too, is superior. It is probably on the basis of these superior capacities that she is able to get along so well.

*Summary:* A case of chronic hydrocephalus following amputation of a suboccipital meningocele at the age of 32 hours is presented. The findings and course twelve years after operation are described. The case presents an unusual survival period, a definite endocrinopathy, a petit mal epileptic syndrome, and satisfactory preservation of intelligence. These features are discussed separately.

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# WHAT THE PUBLIC THINKS OF DOCTORS*

REV. SIDNEY H. BABCOCK, D.D.
HOLDENVILLE

It is a large order my good friend and our genial toastmaster, Dr. Butts, has given me, to interpret the public mind as it relates to doctors schooled in the art of healing. It has been nearly 58 years since I first looked into the face of a kindly physician. Throughout these years that have followed my work as a minister I have been given an opportunity to observe, in much more than a superficial way, the work of doctors, and to ascertain the public mind as to them.

The public mind is sensitive. Every act of every profession reacts upon it. Moreover, the public mind is vacillating. What it thinks today, it may, or may not, think tomorrow. Its judgments today may be overturned by the facts of tomorrow. Popular opinions, sympathetic or unsympathetic, are not always true opinions. The public mind changes with the shifting scenes.

Nevertheless, the public mind is positive and persistent. There are positive opinions which carry through the years and certain public judgments which persist from one generation to another. Whether you agree with me, or not, that the soul persists after death, you will probably agree with me that there are certain positive judgments of the public mind that persist from one generation to another.

However that may be, it is to the persistent public opinion of doctors that I shall now address myself.

The public persists in giving to your profession a very high rank, perhaps the very highest rank. It places the art of healing and the art of disease prevention among the noblest of all arts. This it has done despite the fact that here and there on the horizon there have appeared quasi-scientific and quasi-religious cults that have sought to discount the medical profession.

The public mind gives to the doctors and their families a place in the best social circles. They always have an entree into the best homes and the best circles of society despite the fact that they must frequently be found in the worst and most degraded parts of a community.

The public gives to doctors the high honor of guardians of the public health. In this the doctor has a dual relation. He must make his livelihood by attacking and destroying the causes of the very diseases which call for his services which in turn provide his livelihood. The Great Physician said one time, "A house divided against itself shall fall," but He also said, "Whosoever shall lose his life shall preserve it." The great fight the doctors have made, and are constantly making, to conquer disease has greatly endeared them in the public mind.

Hippocrates, lifting the mind out of primitive superstitions and pioneering the way to the reasonable healing power of nature; Herophilus, father of anatomy, introducing to humanity the brain and nerve centers; Erasistratus, early pneumistic investigator, pointing the way to the intimate relation of mind and body; Disocorides, army surgeon under Nero, laying the foundation for modern pharmacopoeia and sanitation; Celsus, leaving behind him his monumental work, De re Medica; Boerhaave, introducing clinical instruction and with Von Haller lifting physiology into newer and finer interpretations; Steph-

*Delivered at the annual meeting of the Hughes County Medical Society, Holdenville, Oklahoma, February 8, 1935.

en Hales, the country parson and doctor, discovering the dynamics of the circulation of the blood; Galvani, extending the knowledge of electric phenomena to the human body; Morgagni, Italian pathological anatomist taking time amidst his busy practice to write his great work on the "Seats and Causes of Disease"; the immortal Pasteur, revolutionizing the whole theory of medicine and therapeutics by his discovery of living ferment-micro organism which so powerfully affects the whole human process; Sir Humphrey Davy, Faraday, Goldman, James Jackson, pioneers in anaesthesia preparing the way for Dr. Crawford Long to perform the first painless operation under ether at Jefferson, Ga., March 30, 1842; Reed and his noble assistants giving their very lives to stamp out forever the dread scourge of yellow fever; these all, and thousands of others, which might be mentioned if time permitted, together with thousands of illustrous names of our modern world have valiantly fought the battle for public health.

The fine way in which our modern doctors spare neither time nor expense to bring to our communities the best medical thought, the best preventative measures, and, when necessary, the best curative and surgical skill fully justifies the public mind in giving to them the high place in our society that it certainly does.

Then, at last, when the twilight shadows gather and we catch glimpses of gold on the other shore, the doctor still watchful, still faithful, becomes more than a skilled scientist, more than an honored servant of the community, more than a valiant guardian of the public health—now he is "a friend that sticketh closer than a brother."

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## NONUNION IN FRACTURE OF SHAFT OF HUMERUS: REPORT OF FIVE CASES

James Warren Sever, Boston (Journal A. M. A., Feb. 2, 1935), is of the opinion that delayed union and nonunion occur more often in the middle third of the shaft of the humerus after transverse fracture than in any other long bone. Spiral fractures that involve this region may be slow to unite, but so far he has known of no nonunions, or pseudoarthroses. Of the five cases that he reports, three occurred in his practice and two are the misfortunes of others. He believes that one should report failures as well as successes and that there must be some intrinsic cause for nonunion in fractures of the humerus that is not wholly understood. Trauma, from the accident itself, may so destroy the power of bone repair that union is delayed or prevented. Interference with the blood supply through the tearing of the nutriment artery may be another factor. Lack of adequate fixation, which is of the greatest importance, is another probable cause; and in the operative repair, primary internal as well as secondary external fixation is essential for a long period. However, it is practically impossible to immobilize the humerus completely in any type of external apparatus. In spite of an adequate consideration of all these factors, recurrent nonunion may, and does, occur in a certain percentage of cases. Lack of callus formation and interposition of tissue are often factors that must be considered. After his experience in the reported cases, the author believes that the only operation probably worth doing is that advocated by Campbell and Henderson; namely, the massive or onlay graft, followed by a sufficiently long period of fixation to ensure union and to carry one by the period of absorption and possible fracture of the graft. Even this operative procedure is, however, not infallible.

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## RECTAL GONORRHEA IN WOMEN

Clement L. Martin, Chicago (Journal A. M. A., Jan. 19, 1935), points out the fact that rectal gonorrhea, especially in women, is a more frequent complication of genital gonorrhea than is generally known. The chief reason why it is regarded as rare is that it is often overlooked. The conception that the infection usually causes a severe rectal inflammation is not true; anal ulcer, rhagades or condylomas are not common concomitants. Perhaps too many students and physicians have obtained their present notions of rectal gonorrhea from the free clinic or hospital dispensary, where negroes are treated and where proctitis obliterans patients are seen and the probable relation of gonorrhea to the stricture has been stressed. In 111 cases, three presented superficial fissures; perianal suppurative disease was found in three cases; two presented fistulas and one a short sinus communicating with an inflamed fibrosed crypt. In four patients the mucosa of the terminal rectum had a nodular surface; i. e., the early polypoid change that results from chronic mucosal infection. Superficial erosions, in small spots from 1 to 2 mm. in diameter were observed, on the mucosa just above its junction with the skin in four instances. No rectal or anal ulcers were encountered. Although a number of these cases were examined with the proctoscope very early in the course of their genital and rectal infections, the very severe cases described by some writers were not observed. Some of the women had much discomfort, especially at defecation, but not many, and the anorectal inflammation was not uniformly proportionate to the complaint of the patients. Stuhmer has described four phases of the disease. Only the last two usually are seen. In the first phase the mucosa is swollen and fiery red, the mucosal folds are obliterated, the lumen is quite filled with swollen mucosa, and the central orifice is square, irregular or arch shaped. The mucosa bleeds easily and on it there is greenish yellow mucopus. The anus is reddened and very sore. In the second phase the swollen redundant mucosa recedes, the normally arched lumen reappears, the redness lessens, seedlike swellings, the color of the adjacent mucosa are seen, the pus becomes thicker and does not adhere to the wall, and inflammation still is present in the anus. The third phase appears after one or two days; this is the proctoscopic picture commonly seen. There is considerable swelling and redness of the mucosa; the seeded appearance still is generally present, and threadlike pus is noted, which is quite adherent to the intestinal wall. The fourth phase is characterized by the persistence of pus on the normal mucosa. Routine rectal smears should be made of all women who exhibit a gonococcic infection of the urethra or the cervix.

# PRESIDENT'S PAGE

Statement by LeRoy Long, M.D., representing Oklahoma State Medical Association, about Basic Science Bill now before Public Health Committee, State Senate.*

1. Knowledge of the basic sciences enumerated in the bill is necessary in connection with the practice of any one of the healing arts because without such knowledge there is no stable foundation.

Knowledge of human anatomy is knowledge of facts about the structure of the human body. These facts are so fundamental that every healing art based upon even the semblance of scientific procedure must adapt itself to them.

Knowledge of physiology and of physiological chemistry is the foundation upon which many important advancements rest. For example, diabetes is now controlled by procedures based upon such knowledge. Pernicious anemia is under control in the same way. These are cited as comparatively recent conquests, and there are many other examples.

Knowledge of bacteriology is of inestimable importance because 50 per cent of diseases are due to infection by disease producing germs called bacteria. The protection of the people of the world against terrible scourges, like bubonic plague, cholera, typhus fever, is made possible only through knowledge of bacteriology. Typhoid fever is prevented in the same way. Surgical infections are prevented and controlled by procedures based upon knowledge of bacteriology. Application of knowledge gained from the study of bacteriology makes it possible for the United States Public Health Service and our own State Department of Health to prevent epidemics and safe-guard the health of the people.

2. There is nothing mysterious about science which means simply knowledge of facts. That being true, it is reasonable to conclude that any objection to this bill is predicated upon a lack of desire to be acquainted with facts, or upon inability to show a comprehensive understanding of facts that are of fundamental importance in the investigation and treatment of diseases and abnormalities of human beings.

3. The bill is fair to all concerned. It provides for a board of five members who hold teaching positions on the faculty of the State University, the State Agricultural College, or some other State institution of learning in the State of Oklahoma, to be chosen because of their knowledge of the basic sciences indicated. The bill does not provide that they or any of them shall be members of any group or profession engaged in the healing arts. That being true, any of the said groups or professions could be represented on the board when and if they have among them those who are able to qualify under the terms of the bill—that is, those who have a knowledge of the basic sciences to the extent that they can or will be able to secure teaching positions in such sciences in the institutions named in the bill.

4. The motive behind this bill is to increase the efficiency of those engaged in the practice of the healing arts. It does not strike at anything except ignorance and inefficiency, regardless of where or in what group ignorance and inefficiency may be found. Right-thinking people believe in increasing the efficiency of those who serve them in connection with such vital questions as the preservation of health and prevention and cure of diseases and abnormailties. The people of the State of Oklahoma are right-thinking people. They expect and deserve proper recognition and proper protection.

5. In sum, the provisions of the bill are for the best interests of the citizens of the State of Oklahoma. It is not proposed in the interest of any profession, any sect or any group. No profession, no sect, no group is mentioned in the bill. Any profession, any sect, any group practicing the healing arts can, under the provisions of the bill, be represented on the Basic Science Board when and if such representatives can qualify as instructors in any one of the basic sciences taught in the University of Oklahoma, the State Agricultural College, or some other State institution of learning in the State of Oklahoma. The bill provides that no member of the board shall be actively engaged in the practice of the healing art or any branch thereof. We submit that it is fair to all concerned. We submit that any objection to the bill must be construed as either disbelief in the basic sciences, or a confession of inability on the part of the objectors.

*Filed with Committee on Public Health, State Senate, Oklahoma City, March 26, 1935.

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## *EDITORIAL*

### THE 1935 ANNUAL MEETING

The annual meeting at Oklahoma City, May 13, 14, 15, promises to be one of the most interesting and enjoyable in the history of our association.

The meeting will be housed in the Skirvin Hotel; all general and sectional meetings together; the scientific and commercial exhibits and entertainment features being held in this one building. It will not be necessary for you to leave the hotel in order to attend any part of the program—perhaps we will be obliged to make a single exception of the golf tournament.

We have a list of guest speakers that everyone will be anxious to hear; their names, with the subject of their discussions, you will see in a brief outline of the program published in this issue.

Entertainment for the doctors and their ladies has been arranged so that there will be no time when you are not either being entertained or edified.

There is a great deal of important work for the Council and House of Delegates and it is most urgent that members of these bodies be prompt at the meetings as it is not fair to waste the other fellow's time by making him wait for you.

Word received from the President of the Women's Auxiliary indicates that a very interesting program is being arranged and it is sincerely hoped that this part of the program will be liberally attended for the physicians of this state realize the assistance that is being rendered organized medicine in Oklahoma by the wives of the members.

As you look over the committee appointments made by Dr. Henry H. Turner, the General Chairman, you can feel sure that all details will be properly attended to, so all you need do is come and bring with you your suggestions for making the Oklahoma State Medical Association the very best possible organization of its kind.

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## *Editorial Notes—Personal and General*

DR. W. B. AUSTIN, Mangum, is reported ill.

DR. W. W. STARK, Okmulgee, is spending two weeks at Mayos.

DR. FRANK SISLER, Bristow, who has been seriously ill, is reported improved.

DR. H. K. SPEED, Jr., Sayre, has been appointed health officer of Beckham County.

DR. J. B. HOLLIS, Mangue, attended the Dallas Southern Clinical Society in March.

DR. H. B. FUSTON, Bokchito, has been oppointed health officer for Bryan County.

DR. I. D. WALKER, Blackwell, who has been seriously ill, is reported much improved.

DR. B. B. KIES, McAlester, has been appointed superintendent of health of Pittsburg County.

DR. FRANK SISLER, Bristow, who has been ill recently with pneumonia, is reported improved.

DR. ROY FISHER, Frederick, has been re-appointed county health commissioner of Tillman County.

DR. L. J. MOORMAN, Oklahoma City, has been re-elected president of the State Tuberculosis Society.

DR. E. S. PATTERSON, Antlers, has been appointed county health officer of Pushmataha County.

DR. FRANK A. STUART, Tulsa, announces the opening of his offices, Suite 311, Medical Arts Building.

DR. W. C. WAIT, McAlester, has been appointed superintendent of the Western Oklahoma Tuberculosis Sanitarium at Clinton.

DOCTORS H. M. PRENTISS, Nowata, and M. B. Scott, Delaware, have returned from Mayos where they spent two weeks in the clinic.

DR. WALTER HARDY, Ardmore, has returned from Kansas City, where he attended the meeting of the American College of Surgeons.

DR. W. F. GRIFFIN, Watonga, has had his license re-instated as of March 13, 1935, this being the expiration of one year suspension by the State Board of Medical Examiners.

DRS. R. M. ANDERSON and A. C. McFARLAND, Shawnee, together with Dr. Anderson's brother, Dr. E. P. Anderson of Nashville, Tenn., have been on a Mediterranean cruise, and were expected to return to the states in March.

## *News of the County Medical Societies*

LINCOLN County Medical Society met at Chandler March 6th. Guests of the occasion were Doctors Horace Reed, C. B. Taylor and J. F. Kuhn, Oklahoma City, Sam A. McKeel, Ada, and Mr. L. W. Kibler, also of Oklahoma City.

OKMULGEE-OKFUSKEE County Medical Societies met March 12th at Okmulgee, entertaining the dental profession and druggists of the two counties at dinner. Following the dinner the Eli Lilly Company presented their talking picture on the production of insulin.

## AMERICAN MEDICAL GOLFERS PLAY IN ATLANTIC CITY, MONDAY, JUNE 10TH.

The American Medical Golfing Association will hold its twenty-first annual tournament at the Northfield Country Club in Atlantic City on Monday, June 10, 1935.

Thirty-six holes of golf will be played in competition for the seventy trophies and prizes in the nine events. Trophies will be awarded for the Association Championship; thirty-six holes gross, the Will Walter Trophy; the Association Handicap Championship, thirty-six holes net, the Detroit Trophy; the Championship Flight, First Gross, thirty-six holes, the St. Louis Trophy; the Championship Flight, First Net, thirty-six holes, the President's Trophy; the Eighteen Hole Championship, the Golden State Trophy; the Eighteen Hole Handicap Championship, the Ben Thomas Trophy; the Oldguard Championship, limited to competition of past presidents, the Wendell Phillips Trophy; and the Kickers Handicap, the Wisconsin Trophy. Other events and prizes will be announced at the first tee.

### A. M. G. A. Members in Every State of the Union.

Dr. Charles Lukens of Toledo is president and Dr. C. H. Henninger of Pittsburgh and Dr. John B. Morgan of Cleveland are vice-presidents of the American Medical Golfing Association, which was organized in 1915 by Dr. Will Walter, Dr. Wendell Phillips and Dr. Gene Lewis, and now totals 1,100 members representing every state in the union. The living past presidents include Dr. Thomas Hubbard of Toledo, Dr. Fred Bailey of St. Louis, Dr. Edward Martin of Media, Pa., Dr. Robert Moss of LaGrange, Texas, Dr. Charlton Wallace of New York, Dr. Will Walter of Chicago and Charlottesville, Va., Dr. James Eaves of Oakland, Calif., Dr. Chester Brown of Danbury, Conn., Dr. Samuel Childs of Denver, Dr. W. D. Shelden of Rochester, Minn., Dr. Walter Schaller of San Francisco, Dr. Edwin Zabriskie of New York, Dr. Frank A. Kelly of Detroit, Dr. John Welsh Croskey of Philadelphia, and Dr. Homer K. Nicoll of Chicago. The first president of the A. M. G. A., Dr. Wendell Phillips of New York, who played in every tournament since 1915, died on November 16, 1934.

### Atlantic City Committee

The Atlantic City Committee is under the chairmanship of Dr. Walt P. Conaway, 1723 Pacific Ave., Atlantic City. He will be assisted by Drs. I. R. Beir, John Pennington, Alfred Westney, and Rostin White.

The Northfield Country Club of Atlantic City is described by Chairman Conaway as "certainly one of the most interesting courses in this district. Many championships have been held at Northfield, and I am sure the visiting doctors will be delighted with it in every sense of the word. It has a beautiful club house with every facility ready for the pleasure of the guest."

### Application for Membership

All male fellows of the American Medical Association are eligible and cordially invited to become members of the A. M. G. A. Write the Executive Secretary, Bill Burns, 4421 Woodward Avenue, Detroit, for an application blank. Participants in the A. M. G. A. tournament are required to furnish their home club handicap, signed by the secretary. No handicap over 25 is allowed, except in the Kickers' (Blind Bogey). Only active members of the A. M. G. A. may compete for prizes. No trophy is awarded a fellow who is absent from the annual dinner.

The twenty-first tournament of the American Medical Golfing Association promises to be a happy affair. The officers anticipate some two hundred medical golfers from all parts of the United States and Canada will attend.

## IMMUNIZE NOW—STAMP OUT DIPHTHERIA

May Day—Child Health Day has become an established institution throughout the United States. It was inaugurated in 1924 by the American Child Health Association for the purpose of calling the attention of parents, communities, and the public in general to the need for measures to protect the health of children.

In 1928 the United States Congress passed a joint resolution designating May first as Child Health Day, and authorizing the President to issue a proclamation requesting national observance of the day. In 1929 the Conference of State and Provincial Health Authorities of North America appointed a May Day Committee. In 1932 this committee took over from

the American Child Health Association, with the ontinuing assistance of that association, the responsibility for the annual observance of Child Health Day. In the states the work is under the direction of State Departments of Health.

Child Health Day celebrations are intended only to mark and emphasize either the inauguration or the culmination of year-round work for improvement of the health of children. The project for 1935 is diphtheria immunization. This was chosen because there has been but little reduction since 1930 in the number of deaths from diphtheria throughout the country. While particular emphasis will be laid on immunization this year, it is not intended that the project be limited to 1935. On the contrary, one of the chief objectives is to have the work continued year after year by the medical profession.

IMMUNIZE NOW—Stamp Out Diphtheria, is the slogan.

The measures proposed are:

To immunize all children between the ages of six months and six years;

To make early immunization a routine practice by all physicians.

The majority of pediatricians do immunize the babies under their care during the first year of life. Physicians in general practice should follow this procedure.

State departments of health and the unofficial organizations interested in children are calling the attention of parents and communities to the need for early diphtheria immunization. Each individual physician should be prepared to take care of the applications for immunization. Cooperative plans for this work should be made by the local medical societies and departments of health in all communities. When a local medical society has perfected plans for this phase of preventive medicine, there is no reason why it would not be possible to assume gradually other types until eventually preventive medicine forms an important part of the practice of all physicians.

This project offers opportunity for many medical societies and many physicians to assume their rightful leadership in the preventive medical work of their communities.

Descriptions of the plans of certain medical societies for community child health work will be found in:

The Experiments of the Medical Society of New Jersey in Furnishing Community Health Service. Section on "The Public Health Hour," page 162.

LeRoy A. Wilkes, M.D., Executive Secretary, Medical Society of New Jersey. American Medical Association Bulletin, December, 1934.

The Children's Hour. Nassau Medical News, December, 1934. Reprinted in Westchester's Health, February 11, 1935. Published by the Westchester County Department of Health, White Plains, New York.

What the Detroit Plan Offers. Henry F. Vaughan, Dr. P. H., Health Commissioner, Detroit. Reprinted from the December, 1933, issue of Medical Economics.

## ANNOUNCEMENT

The Annual Meeting of the American College of Physicians will be held in Philadelphia April 29th to May 3rd. Philadelphia is the cradle of American medicine and always gives the most wonderful meetings—it being said by many that they would rather attend a meeting in Philadelphia than any other city in the United States, because there is better native material there for the scientific success of a meeting.

## DOCTOR ROSS F. TERRELL

Dr. R. F. Terrell, physician of Stigler, died March 15th in a Fort Smith hospital, after a short illness. Death was due to spinal meningitis.

Born in Tennessee in 1875, Dr. Terrell had practiced at Stigler for the past 33 years.

He was a 33rd degree Mason; a Scottish Rite Mason of the McAlester Consistory, a York Rite Knights Templar of the Oklahoma City Chapter, a member of Amorita Grotto of Fort Smith, and a member of the Shrine at Muskogee. Dr. Terrell was a member of the Haskell County Medical Society, also the Oklahoma State Medical Association.

He is survived by his wife, one son, one brother and one sister.

Interment was at Stigler.

## DOCTOR JOSEPH ORLANDO GLENN

Dr. J. O. Glenn, Stroud, died at his home February 9, 1935. He was born in Roanoke, Virginia, April 3, 1859. Dr. Glenn's medical education was received at the medical college of St. Joseeph, Mo., in 1882. In 1900 he moved to Oklahoma, first locating in Oklahoma City, and in 1902 began the practice of medicine in Stroud.

Funeral services were conducted by Rev. B. E. Newton at the home, with interment in Rose Hill cemetery in Tulsa.

## DOCTOR JABEZ NORTH JACKSON

Dr. Jabez N. Jackson, who at the time of his death, March 10th, was Director of Public Health of Kansas City, Missouri, was 66 years of age. He was a graduate of the University of Kansas City in 1891 and did graduate work at the New York Polyclinic. He was connected with the teaching staff of his alma mater from 1891 until 1911.

Dr. Jackson held membership in many of the leading medical and surgical organizations of the United States and was elected president of the American Medical Association at the Dallas session in 1926. He was awarded the Doctor of Science degree from Park College in 1926 and the Doctor of Law degree from the University of Missouri in 1927.

It has been the pleasure of the Oklahoma State Medical Association to have Dr. Jackson as a guest of honor on many occasions. His last address before our general session was three years ago; however, he has since that time visited the state on several occasions. The profession of the United States in general and the Southwest in particular has lost one of the great leaders in his death and we of Oklahoma will feel his loss more keenly, and extend to his wife and daughter our most sincere sympathy.

# CONDENSED PROGRAM FORTY-THIRD ANNUAL SESSION, OKLAHOMA STATE MEDICAL ASSOCIATION

## OKLAHOMA CITY, MAY 13, 14, 15, 1935

### SKIRVIN HOTEL

General Scientific Sections will be held, beginning at 8:45 A.M., in the Venetian Room, thirteenth floor.

TUESDAY, MAY 14.

8:45 to 9:30 A.M.—Moving pictures.

9:30 to 10:00 A.M.—"Public Health and Organized Medicine in the State of Oklahoma," Dr. Chas. M. Pearce, State Health Commissioner, Oklahoma City.

10:00 to 11:00 A.M.—"The Management of Brain Injury," Dr. F. R. Teachenor, Kansas City.

11:00 to 12:00 A.M.—"Changes Confronting Modern Medicine," Dr. R. G. Leland, Chicago.

WEDNESDAY, MAY 15.

8:45 to 9:30 A.M.—Moving pictures.

9:30 to 10:00 A.M.—Memorial Ceremony.

10:00 to 11:00 A.M.—"Modern Trend in Surgery," Dr. Max Thorek, Chicago.

11:00 to 12:00 A.M.—"Treatment of Toxemia Late in Pregnancy," Dr. M. Edward Davis, Chicago.

### SECTIONS

All Sections will meet at 1:30 P.M., Tuesday, May 14th, and at the same hour on Wednesday, May 15th. Meeting places will be as follows:

*Surgery*—Venetian Room, thirteenth floor.

*Medicine*—Crystal Room, Mezzanine floor.

*Obstetrics and Pediatrics* — Empire Room, Mezzanine floor.

*Eye, Ear, Nose and Throat*—Wilson Room, Mezzanine floor.

*Urology and Dermatology*—Parlor G, Mezzanine floor.

### GENERAL MEETING

COUNCIL.

The Council will meet at 3:00 P.M., Monday, May 13, in Dr. Willour's room, fourth floor, for the transaction of business affairs, and thereafter on call of the President.

HOUSE OF DELEGATES.

Will meet at 7:30 P.M., Monday, May 13, Empire room, Mezzanine floor, and at 8:00 A.M., Tuesday, May 14, same place.

### GENERAL MEETING

TUESDAY, MAY 14.

8:00 P.M.

Empire room, Mezzanine floor, Skirvin Hotel, Dr. Henry H. Turner, General Chairman, presiding.

*Invocation*—Rev. A. G. Williamson, President, Oklahoma City University.

*Introduction of Guests*—Dr. Henry H. Turner.

*Address of Welcome*—Dr. Rex Bolend, President, Oklahoma County Medical Society.

*Response*—Dr. James C. Johnston, McAlester.

*Introduction of President-Elect*—Dr. LeRoy Long, Oklahoma City, retiring president.

*President's Address*—Dr. L. H. Ritzhaupt, Guthrie.

9:30 P.M.

President's Reception and Dance, Venetian Room, thirteenth floor.

### OKLAHOMA COUNTY COMMITTEES

DR. HENRY H. TURNER,
General Chairman.

ADVISORY COMMITTEE.

Dr. L. J. Moorman, Dr. C. E. Barker, Dr. E. S. Ferguson, Dr. LeRoy Long, Dr. Horace Reed, Dr. A. B. Chase.

*Finance*—Dr. Bert F. Keltz.

*Entertainment*—Dr. D. H. O'Donoghue.

*Registration*—Dr. J. C. MacDonald.

*Hotels*—Dr. R. O. Early.

*Memorial Ceremony*—Dr. E. S. Lain.

*Golf*—Dr. Leo. Cailey.

*Scientific Exhibits*—Dr. Ray M. Balyeat.

*Medical Reserve Corps Dinner*—Dr. S. F. Wildman.

*Reception*—Dr. C. P. Bondurant, and members of the Oklahoma County Medical Society.

## SCIENTIFIC EXHIBITS

Dr. Max Thorek, Chicago, Illinois. Title of exhibit: Electrical Coagulation.

Dr. Henry H. Turner, Oklahoma City, Oklahoma. Title of exhibit: Endocrinology.

Dr. Curt VonWedel, Oklahoma City, Oklahoma. Title of exhibit: Plastic Surgery.

Dr. Earl D. McBride and Dr. E. Golfain, Oklahoma City, Oklahoma. Title of exhibit: Treatment of Chronic Arthritis.

Section on Urology, Oklahoma City, Oklahoma. Title of exhibit: Urological Exhibit.

Lain and Roland Clinic, Oklahoma City, Oklahoma. Title of exhibit: Dermatology.

Dr. John F. Burton, Oklahoma City, Oklahoma. Title of exhibit: Plastic Surgery.

Dr. W. K. West and Dr. C. R. Rountree, Oklahoma City, Oklahoma, Title of exhibit: Fracture Exhibit.

Dr. Ray M. Balyeat, Oklahoma City, Oklahoma. Title of exhibit: Therapeutic Value of Iodized Oil in Asthma.

## GOLF

### MONDAY, MAY 13TH

Annual Tournament, Oklahoma City Golf and Country Club (Nichols Hills), starting at 9:00 A.M. Transportation from the Skirvin Hotel will be provided. All green fees paid.

### TUESDAY, 14TH, WEDNESDAY, 15TH

All members of the State Medical Association may play at any of the following courses, green fees paid by person playing:

Oklahoma City Golf and Country Club

Twin Hills Golf Club

Edgemere Golf Course

Lincoln Park Golf Course.

Committee: Drs. Leo F. Cailey and Wayman J. Thompson.

Oklahoma City business firms donating prizes.

## IMPORTANT

Please submit all proposed resolutions to your secretary at the earliest possible moment, in order that these may be referred to the Resolutions Committee before the annual meeting, thereby saving considerable time at the meeting of the House of Delegates. Please do not consider this an ordinary request, for it is important that this be done so that the meeting Tuesday morning, May 14th, may be over in time to participate in the general session program.

## COMMITTEE REPORTS

These reports are made in compliance with provisions of the Constitution and By-Laws which call for publication of such matter in the issue of the Journal preceding the Annual Session.

### REPORT OF THE COMMITTEE ON CONSERVATION OF HEARING

Research of paramount importance is being carried on with regard to the pathology of the labyrinth. The habit now in some institutions of including an examination of this organ in every post-mortem in which there was record of ear-study during life, is sure to be productive of much good. It was this kind of correlation of pathological with clinical work that made of internal medicine an exact science, and there is reason to hope that it will prove very helpful in the field of otology.

Attention has been centered of late with renewed interest upon the problem of otosclerosis. Anything we can find out as to the nature of this disease is of the utmost importance, because it is at the bottom of practically all cases of chronic progressive deafness.

The pathology is located in the bony capsule which surrounds the delicate sensory nerve ending of the auditory nerve, and it is characterized by new formation and deposit of bony material in this structure. There is a predilection of these hard bony growths or spurs to form in the region of the oval window; this results in fixation of the ossicles, paralyzing the mechanism of the middle ear; later the nerve becomes involved, rendering the deafness more profound.

The pathological anatomy is such that we could hardly expect results from the ordinary methods of treatment; in fact, all efforts in that direction have proved unavailing. However, we venture to say there is now ground for hope. One reason for saying this

you will consider strange, namely, that these studies have brought out the fact that otosclerosis is a much commoner malady than we have always supposed it to be.

To explain, let us recall the warfare waged against tuberculosis. It is not so many years ago that the great white plague was looked upon as an unconquerable foe; and it was taken for granted that the poor soul so unfortunate as to fall a prey was soon doomed to die; there was no remedy, there was no hope. But pathologists, as they made numerous examinations on the bodies of pateints who had succumbed from other diseases, soon discovered that many of them presented at the same time foci of tuberculosis in various stages of progress; in fact, that contrary to previous opinion, it was really a common affection. If so many individuals have it, and comparatively so few die of it, it follows that in many cases the process must be arrested or cured. How successful has been the campaign based on this assumption, we all very well know.

Now pathologists, making careful examination of the labyrinth, are telling us that small otosclerotic foci are frequently to be found post-mortem in patients who presented no evidence of deafness during life. We may conclude that as with tuberculosis the process was arrested—or at least never progressed to the serious stage.

Taken as a whole, otology has made remarkable progress. This is particularly evident in the management of our suppurative disease, and their surgical complications. With improved methods and technique we are very much more successful than formerly in curing acute suppurative ears and thus preventing their merging into the chronic; and in the cure of the chronic suppurative without resort to surgical measures. When finally surgical interventions are demanded, they are carried out with greater precision, and more successfully than ever before. The ordinary operation for mastoiditis without complication has become, in the hands of a competent specialist, a simple and safe procedure, and within the last year or so, especially due to the labors of Eagleton, Kopetzky, Almour and others, we are now able to follow an infectious process deep into the petrous portion of the temporal bone at the very base of the brain formerly considered inaccessible. We may boast, too, an increase in our knowledge of intra-cranial complications of ear disease, and a more frequent success in saving cases from a fatal termination.

In accordance with prevalent trend in all branches of medicine, the hygienic aspects of otology have also of late received considerable attention. One of the chief evils of frequent and prolonged colds is their tendency to involve the ears. All, therefore, that we are learning about the cause and prevention of this common malady is of vital importance from an aural standpoint.

### Treatment of Deafness in Childhood

When one begins to approach this subject, in the light of our present day knowledge, he finds that it is necessary to visualize the child as a whole rather than confine his attention to an individual part such as the ear. A great many children have defects of hearing at a very early age which remains unnoticed and many times such defects are accompanied by a devitalized general physical condition. We are inclined to feel that the majority of children suffering from deafness may have their hearing temporarily restored by local treatment but that it is imperative to increase their resistance if one wishes a permanent cure.

Prevention of deafness is the most important thing in childhood. Such prevention can only be accomplished by seeking out those children of pre-school age or school age who are suffering from slight defects of hearing which can be readily overcome.

Very young children, who are not old enough to understand, can not be treated very severely. Such children are subject to frequent colds in the head and nasal sinus infections which can most often be cleared up by proper regulation of the diet, particularly the administration of fat vitamins in the form of cod liver oil. Children of these tender years must be properly and warmly clothed. The tonsils and adenoids of all such children must be removed as soon as any evidences of an ear condition develops.

Older children between the ages of eight and fourteen can usually be treated when once the confidence of the child is obtained, Often times it is necessary to allow a new patient to watch you treat an old patient until he sees that you are not going to do anything to hurt him. The type of treatment will depend on whether you are treating a suppurative condition or a so-called catarrhal one.

Suppurative ears in children have been a grave problem for a number of years. There was a time when many of these little patients were forced to submit to a radical mastoid operation but it is our opinion that such operations are unnecessary in the majority of cases. In all these purulent conditions the patient must be seen at regular intervals and the ears kept as clean as possible. Wiping out the ear canal frequently during the day with a small piece of cotton is preferable to irrigation. When the patient presents himself at the office the type of treatment to be used will vary with the individual case.

In acute purulent otitis media we recommend an early incision of the drum membrane or paracentesis. After the paracentesis the patient should be seen daily by the physician. If the ear is properly taken care of in the acute stage there is very seldom any complications.

### Treatment of Deafness in Adults

It is seldom that one sees a deafened patient, with any marked degree of deafness, without feeling that he is dealing with an entity which needs physical and mental reconstruction. Hard of hearing patients not only suffer from definite defects in hearing, but from certain mental and physical disturbances which place them in a class by themselves. He resents the fact that he is hard of hearing; he refuses to admit that other people think he is hard of hearing; he feels that the world is not treating him in the same way as it would if he had good hearing and, taking it all together, he places himself in a position where he is resistant to almost every line of suggestion for his improvement that is given him. Taking all these factors into account, how can one possibly think that he can obtain any improvement in an individual by the ordinary time-worn methods of treatment?

In treating the adult hard of hearing, one must keep in mind that he is after two results. The first is the actual improvement in the patient's hearing, and the second is actual improvement in the patient's well-being so that he is able to bear his handicap with greater fortitude and thus attain greater hearing. Regardless of all local therapeutic measures which we employ, nothing can be accomplished unless one takes into consideration the general phvsical condition of the patient, the local condition of the nose and throat and the psychological reaction of the patient. In treating hard of hearing people, one must realize two facts. First, of his treating a definite ailment which he should improve if possible, and secondly, he is treating an individual whose entire life's

happiness depends upon how much his mental attitude towards his ailment can be overcome.

J. E. Davis, Chairman;
L. C. McHenry,
Charles M. Fullenwider.

## REPORT OF THE COMMITTEE ON MEDICAL ECONOMICS

The subject of medical economics has been foremost in the minds of the profession, some departments of our federal government, and a number of lay organizations throughout our country. Two important bills in Congress have had active support both in Congress and from without. Both are direct steps toward the establishment of state medicine and have aroused the active and united opposition of organized medicine. Present indications are that neither of these bills will pass at this session of Congress but their advocates will continue the fight for their enactment and the burden of their opposition rests directly upon the medical profession.

The House of Delegates of the American Medical Association at the annual meeting voiced their opposition to all such measures and at a call meeting in February reaffirmed their stand and in addition made some suggestions as to how local medical societies could meet some of the problems that have become acute during the present general depression.

In some parts of the state the local societies have started moves to try to work out something from their suggestions but so far as we have been able to learn no definite plans have been adopted.

The result to date is an almost unanimous decision of the medical profession to support the action of the House of Delegates of the American Medical Association; that is, that whatever is done must be controlled directly by the medical profession and not by federal, state or local governments, nor by any lay organizations.

The question of pay for medical services to FERA employees and their families was taken up by this committee but was later transferred to a special committee, all of whose members live in Oklahoma City where they can be in contact with the administrator.

P. P. Nesbitt,
E. P. Davis,
Ben H. Cooley,
Committee Medical Economics.

## REPORT OF COMMITTEE ON "STUDY AND CONTROL OF CANCER"

Since our last report, the cancer situation is unchanged and the need for active, intelligent effort is still as necessary as ever. The purpose and the organization of the cancer work remains the same.

### Work in 1935

Since the 1934 report was made the following meetings, clinics and lectures were sponsored by the local county societies:

| County Medical Societies Sponsoring all Clinics and Lectures | No. of Patients Examined | Attendance by Physicians, Nurses and Laity—Est. |
|---|---|---|
| 1. McAlester (Pittsburg Co.) | 0 | 45 |
| 2. Woodward (Woodward Co.) | 26 | 125 |
| 3. Oklahoma City (Okla. Co.) | 0 | 200 |
| 4. Shawnee (Pottawatomie Co.) | 3 | 125 |
| 5. Sayre (Beckham Co.) | 10 | 200 |
| 6. El Reno (Canadian Co.) | 12 | 45 |
| 7. Duncan (Stephens Co.) | 0 | 175 |
| 8. Tahlequah (Cherokee Co.) Northeastern State Teachers College | 0 | 1100 |
| 9. Shawnee (Pottawatomie Co.) Oklahoma Baptist Univ. | 0 | 170 |
| 10. Alva (Wood Co.) Northwestern State Teachers College | 0 | 1000 |
| 11. Ada (Pontotoc Co.) East Central State Teachers College | 1 | 850 |
| 12. Durant (Bryan Co.) Southeastern State Teachers College | 2 | 250 |
| 13. Alva (Wood Co.) Rotary Club | 0 | 40 |
| 14. Ada (Pontotoc Co.) Rotary Club | 0 | 40 |
| 15. Durant (Bryan Co.) Rotary Club | 0 | 36 |
| 16. Seminole (Seminole Co.) | 2 | 24 |
| 17. Bartlesville (Washington Co.) | 14 | 200 |
| 18. Tahlequah (Cherokee Co.) | 15 | 1000 |
| 19. Wagoner (Wagoner Co.) | 3 | 5 |
| 20. Enid (Garfield Co.) Kiwanis Club | 20 | 30 |
| 21. Altus (Jackson Co.) | 5 | 19 |
| | 119 | 5749 |

Wherever clinics and public meetings have been held the profession has been pleasantly surprised at their reception and value.

The lectures to the State Teachers' Colleges have been popular and are thought to be productive of much good.

The organization of these clinics and meetings have been possible only through the splendid work of Mr. L. W. Kibler with the Department of Public Relations of the State University,

The American Society for the Control of Cancer has given invaluable assistance in many ways, principally in furnishing literature, projection equipment and films.

Plans are now being made for clinics and meetings in the Oklahoma Panhandle.

### Finances

To defray minimum expenses, such as organization, clerical work and traveling expenses, it has been necessary to charge each County Society $12.00 to defray actual expenses.

At the Tulsa meeting in 1934 an appropriation of $250.00 was made for the purpose of use for expense connected with the work in localities where there was no medical organization or where the medical society could not afford to pay $12.00. To date only two withdrawals have been made from this fund, namely: Wagoner County and Cherokee County for a total of $24.00. The planned trip into the Panhandle will require an estimated expense of $50.00. This will leave $176.00 of the original $250.00 unused.

It is hoped that the Council and House of Delegates will find it possible to appropriate not less than $250.00 for the use of this committee in the ensuing year.

Wendell Long, Chairman;
James Stevenson,
E. S. Lain.

## REPORT OF COMMITTEE ON POST-GRADUATE MEDICAL TEACHING

A report of this committee is necessarily very brief this year because no post-graduate medical courses have been given. Arrangements were made during the summer and early fall for a course during the winter months, but at a late date some members of the faculty resigned, and it was necessary to discontinue this course.

Your committe then decided that, inasmuch as a new state administration would soon be inauguarted and there was a possibility that the Board of Regents might rescind its order of last year abolishing medical extension, it would be best to await further developments. At the time of writing this report no action has been taken by the board.

Inasmuch as the organization and conduction of these courses requires the constant time of an individual, the committee recommends that it be empowered by the House of Delegates to employ such a person, and that a working fund of at least $2,400.00 be created for this purpose, to be known as the Post-Graduate Medical Teaching Fund. The fees derived from the courses would likely be sufficient to cover expenses, and the fund would probably not be used.

The committee also suggests that the House of Delegates request the Governor and Board of Regents to re-establish post-graduate medical teaching in the University, and on the same status which it formerly functioned.

Henry H. Turner, Chairman;
Wann Langston,
H. C. Weber.

## CALCINOSIS CIRCUMSCRIPTA: REPORT OF CASE

Gale Wilson, Seattle (Journal A. M. A., Feb. 2, 1935), observed a typical case of calcinosis circumscripta, with extensive blood chemistry and clinical observations over a period of one year. The blood chemistry tends to show that the deposits of calcium phosphate in the fingers may be due to an endogenous hypervitaminosis D caused by an unusually high blood cholesterol (480 mg. per hundred cubic centimeters) superimposed on an old, remitted Raynaud's disease. All types of eliminatives have been tried, as well as changes in the acid-base ratios, high protein, low protein, fat free, purine free and other diets, all without doing other than slightly slowing up the rate of maturity of the nodules, even after the blood chemistry had been restored to normal.

## ADVANCES IN OVARIAN THERAPY

A gynecologist, whose name is known from coast to coast, recently commented in the Journal of the American Medical Association (February 23rd) about the cost of ovarian therapy: "It is greatly regretted," he wrote, "that the American products have not been available at prices that justify their preference or at least their being on a parity with the imported material."

Physicians who have read this statement will be interested in the announcement from the Squibb Laboratories that the potency of Amniotin—a physiologically tested preparation of the ovarian follicular hormone, has been increased three-fold and the cost per unit has been reduced to about one-tenth of its former price. For hypodermic administration, Amoniotin in Oil is now distributed in 1 cc. size ampuls, containing 8000 and 2000 International Units per cc.

Amniotin Capsules and Pessaries (vaginal suppositories) now contain 1000 and 2000 International Units, respectively. The price of these packages is now so low as to compare favorably with the cost of insulin.

These new high-potency preparations should make ovarian hormone (estrin) therapy eminently more satisfactory. Amniotin is indicated in the treatment of menopausal symptoms; involutional melancholia; gonorrheal vaginitis in children; senile vaginitis; breast hyperplasia (lobular type associated with bleeding); selected cases of frigidity, and migraine of pituitary origin.

## CIGARETTE SMOKE

Michael S. Mulinos and Raymond L. Osborne, Pharmacology of Inflammation: III. Influence of Hygroscopic Agents on Irritation from Cigarette Smoke. Proc. Soc. Exp. Biol. & Med. 1934, 32, 241-245. A successful attempt to measure objectively the irritant properties in cigarette smoke is reported. The method used was that described by Hirschhorn and Mulinos: Proc. Soc. Exp. Biol. & Med., 1930, 28, 168. A study of the influence of hygroscopic agents on the edema produced on the conjunctive of rabbits is given. The hygroscopic agents most commonly used in cigarettes are glycerine and diethylene glycol. It was stated that "It is obvious that the cigarettes which have been made with diethylene glycol as hygroscopic agent prove to be less irritating than those with glycerine." Not only was the irritation greater in the case of glycerine than from diethylene glycol, but it lasted a longer time. It is further stated that, "The edema produced by the smoke solution from the untreated cigarette lasted an average of 31 minutes (8-82); that from the diethylene glycol lasted 8 minutes (0-21); and that with the glycerine lasted 45 minutes (17-122)."

## TREATMENT OF PERFORATED "PEPTIC" ULCERS

Hugh H. Trout, Roanoke, Va. (Journal A. M. A., Jan. 5, 1935), discusses the acute perforations that demand immediate operation. The deductions reached are based largely on personal experience in the treatment of forty-one such cases. This experience has been greatly influenced, however, by numerous visits to other hospitals, conversations with other surgeons, and a careful review of the literature. Of course it is generally conceded, even by the radical adherents of the nonsurgically inclined of medical men, that surgery offers the best hope of recovery. Therefore the author confines his discussion to surgical intervention in this condition, considered under the following three headings: (1) drainage after closure of the perforation, (2) advisability of immediate gastro-enterostomy following closure of perforation and (3) treatment of perforations on the posterior wall of the stomach and duodenum associated with hemorrhage, from which he draws the following conclusions: 1. Drainage of the peritoneal cavity should be avoided if possible. 2. Continuous gastric suction through a nasal tube has decreased the indications for an immediate gastro-enterostomy. 3. Partial gastric resection is the operation of choice in those cases of posterior perforations of the stomach or duodenum which are associated with massive hemorrhage.

# ABSTRACTS .. REVIEWS .. COMMENTS AND CORRESPONDENCE

## *INTERNAL MEDICINE*

Edited by L. J. Moorman, M.D., 1200 N. Walker, Oklahoma City; C. E. Bradley, M.D., Medical Arts Building, Tulsa; Hugh Jeter, M.D., 1200 N Walker, Oklahoma City

By C. E. BRADLEY, M.D.

**Cevitamic Acid (Ascorbic Acid) in the Treatment of Infantile Scurvy. Arthur F. Art, M.D., and I. M. Epstein, M.D., Chicago, Ill. J.A.M.A., Volume 104, Number 8, February 23, 1935, page 634.**

In 1928 Szent-Gyorgi isolated a chemical which he believed was hexuronic acid and was identical with vitamin C. Well controlled experiments in laboratory animals showed that the chemical did protect them against scurvy.

Although the chemical has been shown to be $C^6H^8O^6$, cevitamic acid, instead of $C^6H^{10}O^7$, hexuronic acid, it has been produced in crystalline and tablet form by Merck and Company. Their product is called Cebione and the authors cite five cases from the literature in which 30-40 mg. of Cebione daily (administered orally or intravenously) was responsible for recovery of humans from scurvy.

In 1933 Kramer showed in his studies with 18 healthy infants that premature infants tolerated 15 mg. of cevitamic acid daily (orally), new-born infants from 20 to 25 mg. daily, and healthy older nurselyings from 25 to 50 mg. daily without any ill effects.

The authors presented three cases: an eleven months old male infant, a one year old female child, and a nine months old female infant, who were admitted to the hospital with clinical and roentgen examinations typical of scurvy. Cevitamic acid was given orally by dissolving one tablet (10 mg. with lactose) in 10 to 20 cc. of water. The first infant was given 30 mg. of cevitamic acid orally for one month, at the end of which time the scurvy as well as secondary abscesses were healed. The other two infants received 30 mg. of cevitamic acid daily for four days and then 40 mg. daily for ten days. Both had recovered from scurvy at the end of this time. Both of the later patients showed a marked decrease in tenderness in 12 to 48 hours after the first administration of cevitamic acid.

The cevitamic acid content of the blood was determined by the methods described in "Microchemical Method for Determining Hexuronic Acid Content of Foodstuffs," by L. J. Harris and S. W. Ray, Biochem. J. 27: 590, 580, 1933, showing that the cevitamic content of the blood was diminished in the patients who had scurvy and that the administration of Cebione definitely increased the amount in the blood stream. The determination of the cevitamic acid content of the urine was not considered significant. If these methods prove sufficiently accurate, it may be possible to demonstrate definitely a prescorbutic state in infants and children who manifest no symptoms of active scurvy.

**Celiac Disease (Chronic Intestinal Indigestion). A Report of Three Cases With Autopsy Findings. Julius H. Hess, M.D., and Otto Saphir, M.D., Chicago, Illinois. "The Journal of Pediatrics," Vol. 6, No. 1, January 1935, page 1.**

Celiac disease, as it is clinically known, is a manifestation of chronic indigestion, showing abdominal distention, intermittent attacks of diarrhea—with large, pale, mushlike, foul-smelling stools. The symptoms are much more difficult to interpret in earlier stages of the disease.

The anatomical findings are still the subject of much controversy, and a survey of the literature shows that changes in almost every organ of the digestive tract and in the glands of internal secretion have been held responsibile for celiac disease from time to time. If such changes were not found, primary functional disorders were thought to be the causative factors.

### Case Reports

Three cases were presented with special emphasis placed upon the histopathological findings. 10% formalin fixed sections of the thyroids, suprarenals, thymus, liver, pancreas, and gastrointestinal tract were stained in addition to hemotoxolin-eosin, by van Gieson's method, Foote's recticulum, and Wartin-Starry method for presence of connective tissue, reticulum fibers and spirochaeta palliada, respectively.

Case 1. **Onset and Course:** A white female, 9 months old, infant weighed 7½ pounds at birth. She had a history of frequent bowel movements, dating from shortly after birth; was breast-fed with complementary feedings of pasteurized milk till she was 4½ months old, and was then placed on cow's milk with carbohydrates. She was admitted to the hospital first at 5 months with a diagnosis of celiac disease. She had no illness except intestinal distress with four to six large stools daily. She weighed nine pounds, fourteen ounces. She was placed on a high protein diet and discharged after 13 days in the hospital. She was under observation for the next 4 months and although she was kept on a high protein diet had several recurrences of intestinal disturbances. At 9 months she was readmitted with a diagnosis of bronchial pneumonia. She weighed 12 pounds, 14 ounces, and showed no symptoms other than those of pneumonia except distended abdomen. She died 12 days after admission.

**Autopsy Findings:** Bronchopneumonia with abscess formation, chronic pancreatitis with much fibrosis, pancreatic lithiasis with dilation of the ducts, chronic enteritis, and fat infiltration of the liver (centrally located), Warthin-Starry stains failed to reveal spirochaetes and the suprarenals, thymus, and thyroid revealed no histopathological changes.

Case 2. **Onset and Course:** A white male infant, age 19 months, had ten to twelve stools daily, composed largely of mucous and curds from birth to 6 months of age. After 6 months the stools were more normal in color but were large and foul in odor. Vomiting was also frequent up to the third month. Feeding: Breast milk complemented by cow's milk with dextrimaltose to two months of age, complementary feeding of protein milk during the third

month, protein milk alone from the third to the sixth month. Then he was placed on goat's milk for one month, and then on Carnation milk until he was nine months old, when he weighed 16 pounds, 10 ounces. At this time he developed tonsillitis and lost 1 pound, seven ounces. He was admitted to the hospital first at 10½ months with diagnosis of rickets and chronic intestinal indigestion, with possibility of a food allergy. He was placed on a high protein diet and discharged in 10 days. He continued on this diet with cod liver oil and viosterol and was readmitted to hospital at 18 months with diagnosis of influenzal pneumonia and died on the third day after admission.

**Autopsy Findings**: Bronchopneumonia, recent chronic pancreatitis with much fibrosis, pancreatic lithiasis, dilation of the pancreatic ducts, chronic enteritis, abnormal length of the jejenum, and fat infiltration of the liver (centrally located) spirochaetes were not demonstrated, and suprarenals, thyroid and thymus showed no histopathological changes.

Case 3. **Onset and Course**: A white female child, age 3 years, was admitted first at 7 months. She was breast-fed for two weeks, placed on cow's milk formula for two months, and then was placed on various formulas in the next six weeks because of unsatisfactory gain in weight. She developed her first attack of diarrhoea at four months, which continued for one month with recurrence three weeks later.

She was admitted to the hospital the second time at three years, with a history of recurrent attacks since the last admission. She had had pneumonia at 1½ years, and measles at 2½ years. The admission diagnosis, one day before her death, was anhydremic intoxication, celiac disease, and athrepsia.

**Autopsy Findings**: Bronchopneumonia, fibrosis of the pancreas, nephrolithiasis, multiple diverticula of the stomach, chronic gastroenteritis, and fat infiltration of the liver (diffuse). Suprarenals, thymus, and thyroid were negative, as well as stains for spirochaetes.

The authors feel that their cases, as some others suggested in the literature, suggest that primary disease of the pancreas may play an important part in the development of celiac disease, and although the series they present is too small for generalization they wish to stress the need for a careful study of the pancreas, with special staining methods if necessary, before it is pronounced normal.

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**The Protracted-Fractional X-Ray Method (Coutard) in the Treatment of Cancer of the Larynx. J. H. Douglas Webster, London. The Journal of Laryngology, Vol. 49, Page 429.**

The variety of the methods of treatment for cancer of the larynx has been most confusing to the student of laryngology. Dr. Webster recounts his extensive experience in an interesting manner describing his five or more alternating phases of hopefulness or discouragement. He summarizes the five essentials in Coutard's method of treatment as follows: 1. The use of high voltage (180 or 190 kw.), filtration by 1.5 to 2 mm. of copper or zinc, skin focal distance of 50 or more cm., and two directly opposing lateral fields, with or without supplementary fields on the affected side (in extensive pharyngeal growths, in patients with marked adenopathy, or in patients with very thick necks). 2. Each dose must be **protracted**, i. e. must have a low minute-intensity as compared with ordinary X-ray treatment technique. Coutard's choice of degree of protraction gives doses which per minute are ten to twenty times weaker than the doses given by the usual methods. Thus, for example, 150 or 180 r will be given in 50 or 60 minutes (3-4 r per minute, not 30 to 40 r or more, as is often given). 3. The doses are **highly fractionated** (as compared with other fractional methods. Thus at least two daily doses are given, for example, one for an hour in the morning and one for half an hour in the afternoon, with the exception of Sundays; and the doses are divided up over two, three, four or more weeks: the larger the area involved, the longer must be the total period of treatment, as the patient cannot be treated for more than three or four hours a day, if we would avoid undesirable general reactions. 4. An extraordinary **high total dosage** is administered (and regarded as necessary) as compared with most other symptoms of dosage: on the surface a total of ten to twenty times the mild "erythema dose" in all may be given, and given with safety. 5. For each patient the dose must be estimated beforehand carefully, and then it must be controlled by accurate measurement of the H or, as later used, the r units: and further and most essentially, controlled by the appearance in the pharynx and larynx of the white fibrinous mucosal reaction, and by the appearance on the skin of an epidermitis. The radiologist must be experienced in laryngoscopic examination and should examine the patient daily to note the extent of the mucosal reaction. The skin dose given is the "epidermicidal" dose—Regaud and Nogier first described it in 1913—the effect of which is rather alarming when first seen, but soon passes away, when resulting from the given conditions, with complete repair. The patients should not be treated as ambulant cases; they must be under close supervision, as in advanced cases laryngeal oedema may necessitate a tracheotomy if this has not been performed previously. The method is based upon clinical observation of treatment of tumors arising from different sites in the larynx-tumours either of the skin or of the mucosal type. When a dose has been sufficient to destroy the normal epithelium temporarily, a tumour arising from similar epithelium should also respond to such treatment. For instance, if a dose of about 45 H (4,500 r) is required for the destruction of normal epithelium, and for the mucous membrane reaction about 35 H (3,500 r), then to ensure that such doses reach the level of the lesion to be destroyed, we should have to give about a surface dose double that which we wish to give deeply on the mucosa. It is easy to give a total dose of 7,000 r for epitheliomas of the mucosal type, but for the epitheliomas of lesser sensitivity (skin type) it is difficult to reach a total dose of 90 H or 9,000 r without exceptional care in the technique and administration. When Coutard's doses have reached more than 10,000 r, as a rule there has been no cure and damage has resulted.

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**Pulmonary Lesions Resembling Pneumonia As the Result of Allergic Shock. George L. Waldbott, M.D., and A. D. Snell, M.D., Detroit, Mich. "The Journal of Pediatrics," Vol. 6, No. 2, February 1935, pages 229-233.**

Experimentation has shown that in animals which survive anaphylactic shock following an injection of antigen, the syndrome of protracted shock develops: dyspnea, irregularity of breathing, partial pulmonary emphysema, and fall of blood pressure, drop in temperature which is followed by a moderate degree of fever. Dean and Webb have shown that in dogs that survive severe cases of anaphylactic shock the following symptoms occurred after the acute stage had passed: dyspnea, fever, diarrhea, stupor, vomiting, and general malaise. Identical conditions have been produced in guinea pigs with the injection of antigenic substances after the production of shock. The

lesions which thus arise under properly controlled conditions may either offer the picture of interstital bronchopneumonia, or they may involve lobes; but the microscopic picture suggests that there is a pathologic difference from the true pneumonia.

In two cases which the authors have presented previously the patients developed low grade bronchopneumonia, which lasted three to four days, eight and twenty hours, respectively, after the injection of extracts of cottonseed and horse hair. A similar occurrence was encountered following the ingestion of an aspirin tablet in a patient with severe asthma.

During the course of studies on so-called "thymic death," one of the authors presented clinical and pathological evidence that many, if not all, cases thus diagnosed are identical with allergetic shock; in a large percentage of these cases after collapse a clinical picture typical of low grade pneumonia develops as illustrated in the following cases:

Case 1: A one year old male infant had been in perfect health except for frequent allergic nasal catarrhs. About a week before death he had an afebrile upper respiratory catarrh from which he recovered in a few days. On the day of his death he appeared perfectly healthy until he became suddenly cyanotic and dyspneic, while drinking a glass of milk, and vomited. The cyanosis, and dyspnea increased, moist rales were noted in the lungs, and signs of consolidation appeared. The temperature rose until at 3 P.M. it was 105. He died at 6 P.M.

In this, as well as in the other cases studied, the microscopic appearance of the lungs suggested that there was a primary edema of the lungs associated with atelectatic and emphysematous areas upon which the infectious process seemed to be superimposed. This was particularly noticeable in some of the slides in which the leucocytic infiltration involved only the marginal parts of the edematous lesions.

The authors felt that this was evidence for the explanation of this type of pulmonary infection and that it would be of value to establish certain clinical features which would lead to a proper recognition, evaluation and therapy of this condition, so they made a study of 12 allergic children, two cases of which were cited. They found that five exhibited the clinical picture of the usual pneumonia. In seven cases, however, there was an afebrile period ranging from 6 hours to 5 days which was characterized by wheezing and dyspnea and by collapse. The infectious process may have originated upon an edematous hemorrhagic process of allergic origin.

In attempting to differentiate this type of pneumonia from other pulmonary lesions, they found the following clinical features to be of diagnostic values: the presence of an afebrile period with collapse and associated asthmatic symptoms, a lesser severity of the infection and a shorter duration than in the ordinary pneumonia and a relatively low white blood count at the onset of the febrile period.

To the clinician, the above observations are of definite importance, because they indicated that a history of pneumonia or "influenza" in an allergic child may be the result of an allergic pulmonary reaction, rather than that of a primary infection, ruling out the indication that the patient's asthma is of an infectious type. Moreover, in treating such "pneumonia," repeated small doses of epinephrine to combat the edema, removal of sensitizing agents, and measures usually advocated for combating edema, may be of paramount importance and may possibly constitute a life-saving procedure.

By Hugh Jeter, M.D.

**The Enumeration of Blood Platelets. Isadore Olef, M.D., Boston, Mass. The Journal of Laboratory and Clinical Medicine, Vol. 20, January, 1935, No. 4.**

In this, the author reviews the various methods of making blood platelet counts and gives the details of a method which he has found more satisfactory than others.

He divides various methods into direct and indirect. By direct method he includes those in which a dilution is made to eliminate other cellular elements. In consideration of this method he gives a table showing the names and results of 24 different authors. It is very interesting to note the variation of normal or average number of platelets per c. mm. given by different authors by different methods, ranges from one hundred thousand to one million.

By the indirect method he includes those in which dried smears are made and stained and by estimating the ratio of platelets to erythrocytes, the number of platelets is calculated. Here again he gives a table enumerating 27 authors and their results which range from one hundred fifty thousand to eight hundred sixty-eight thousand platelets per cu. mm. He refers to true indirect methods and modified indirect methods, and also gives interesting data on the size of the thrombocyte.

He concludes that the most accurate methods are the indirect, and gives his modification as one which has been satisfactory. By his method the platelet counts from thirty-eight normal persons, twenty-two males and sixteen females, were as follows: "The minimum count for the group was 437,000 platelets per cubic millimeter; the maximum, 586,000. The average for the group was 514,000 platelets per cubic millimeter; the average for males was 525,000, that for females was 504,000."

**Comment:** We must face the fact that platelet counts are not accurate. I agree that the simple indirect methods are the best. It is fortunate that extreme accuracy is not a clinical necessity.

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**Water Studies in Obesity. Elmer C. Bartels, M.D., Springfield, Ill., and Benjamin Blum, M.D., Rochester, Minn. The Journal of Laboratory and Clinical Medicine, Vol. 20, January, 1935, No. 4.**

The authors refer to many important studies by different authors, which apply to water metabolism. He refers to the work of Pratt and Buck & Prager, who have concluded that in normal individuals the output of urine in four hours should be equal to or greater than the intake.

Janney and Walker, testing water balance in pregnancy, found that normal control subjects who had ingested 1,200 cc. of water eliminated 1,353 cc. in four hours, whereas during pregnancy the output declined progressively among clinically normal pregnant women in the last twelve weeks of pregnancy. He attributed this to a lower functional capacity of the kidneys in the latter weeks of pregnancy and considered this as a precipitating factor in toxemic stated.

Malmuc was the first to make studies in obesity. She reported a decrease in the output. The author reports a case of obesity and diabetus mellitus, 65 inches in height, female, 44 years of age, and weighing 265 pounds, whose dilution test (modified Volbard) yielded a total of 705 cc. of urine following a 1500 cc. intake. She was placed on a reduction diet and daily studies of weight, water intake and output

were made. "The total intake of fluid for the nineteen days in hospital was 22,090 cc. and the total output was 28,100 cc. The output exceeded the intake by 6,010 cc. (13 lbs.). If this is added to the actual weight (245 lbs.) a total of 258 pounds is obtained which is approximately two pounds more than the calculated weight of 265 pounds. This indicates that the forced weight loss was entirely at the expense of the body fluids and explains the reason for the ultimate outcome in which the actual loss and the calculated loss of weight are almost identical at the end of ten weeks."

One month afterwards the dilution test yielded 1910 cc. and the authors felt that "this excessive response was due entirely to the diuretic action of water." Thus there appeared to be an apparent benefit from the excessive intake of water in obesity.

From the single case as a suggestion of disturbed water metabolism, a further study resulted. 102 subjects were studied with weight and dilution tests: 7 underweight; 22 who were 0 to 10% underweight; and 32 who were more than 10% overweight. The results shown in tables are very interesting.

Their conclusions are as follows: "Disturbance in water balance does occur during attempts at reduction in weight in cases of obesity as is shown in literature and the case reported. In obese subjects who are not on diets, there is some slight evidence of retention of water as is indicated by the Volhard dilution test. This retention of water is more marked in overweight subjects. In obese subjects there is evidence of a sustained output, as indicated by the moderately high output of 119 cc. as against a normal output of 88 cc. in the fourth hour, as well as a slight reduction in total output. Obese subjects do not retain fluids to a great degree, as in only 7% was the output less than 1,000 cc. Underweight subjects have smaller total outputs in four hours than obese subjects."

## *ORTHOPAEDIC SURGERY*

Edited by Earl D. McBride, M.D.
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**"Reconstruction of the Forearm After Loss of the Radius." R. Watson Jones, British J. Surg., XXII, 23, July, 1934.**

The Hey Groves operation was used on a girl of nineteen who had had a diaphysectomy for osteomyelitis. The operation consisted of implanting the distal end of the ulna into the small distal end of the radium. As a preliminary operation the inferior radio-ulnar dislocation was reduced to get rid of the prominent bulge at the lower end of the ulna.

The cosmetic results, as shown by the photographs, were excellent. There was, of course, complete loss of radio-ulnar movement. Wrist motion was 80 per cent of normal. With the aid of the shoulder muscles it was possible for the patient to obtain the full palm-down position of the hand and also to bring the palm up to the face and neck.

**"Bone-Graft for Non-Union of the Carpal Scaphoid." Gordon Murray, British J. Surg., XXII, 63, July, 1934,**

An operation is described for use in non-union of the carpal scaphoid. The author does not state the time limit for union or whether the operation should be used in fresh fractures to prevent non-union. The essential difference in the technique from that in use in other clinics is the passage of the graft through the fragments via a drill hole.

The incision is made along the radial surface of the wrist joint, extending one and a quarter inches upward and downward from the radial facet of the scaphoid, with the hand in full adduction. The tuberosity of the scaphoid is exposed by retracting the radial nerve and vessels and the abductor tendons of the thumb anteriorly and the extensor pollicis longus tendon posteriorly. A small area of the tuberosity is removed by rongeurs. A transverse incision is thea made in the dorsal capsule of the wrist joint and the fracture line exposed. A five-sixteenths-inch bit is used to drill through the two fragments, starting in the rongeured area of the tuberosity. A piece of cortical bone from the tibia is passed through the drill hole. Great care is taken not to destroy any cartilage during the drilling and not to leave any overhanging graft.

Details of five cases are given with a note that four more have been successfully treated. These cases were operated on two, four, one, seven, and five months, respectively, after injury. In each case the hand was kept in a cock-up plaster for eight weeks, Bony union took place and there was complete restoration of function.

**"Studies in Bone Sarcoma." II. Is New Bone Formation in Osteogenic Sarcoma the Result of a Local Supersaturation of Tissue Fluids With Calcium? Alexander Brunschwig and Paul H. Harmon. Amer. J. Cancer, XXII, 342, October, 1934.**

The authors conducted experiments in which calcium in several forms was injected into a growing transplantable mesoblastic tumor of rats. There was no new bone formation in the tumor in any of the thirty-seven animals used in the experiments. From these findings the authors concluded that calcium itself is incapable of rapidly bringing forth osteoblastic properties in malignant mesoblastic cells which do not exhibit such properties under usual circumstances of growth.

This study is not a particularly convincing argument against the humoral hypothesis for new bone formation in osteosarcoma.

## *SURGERY AND GYNECOLOGY*

Abstracts, Reviews and Comments from LeRoy Long Clinic
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**The Present Status of the Sterility of Surgical Catgut Sutures. By Ralph Oakley Clock, M.D. Surgery, Gynecology and Obstetrics, February, 1935.**

As a result of his finding virulent spore-forming anaerobic bacteria of the gas gangrene group in a batch of catgut sutures used in the operative wounds of five patients in a New York City hospital, nd in whom gas gangrene that was fatal occurred—coupled with his recovery of the same organism from one of the fatal cases—a comprehensive study of the sterility of catgut was proposed by Dr. Frank L. Meleney. His aim was "that it shall not be possible for anyone to buy on the market catgut that is not absolutely sterile."

Later, Meleney and Chatfield submitted an effective test, of a bacteriologic nature, for the sterility of catgut and reported that the products of ten firms had been found sterile, while the sutures of seven firms

had proved to be non-sterile when subjected to this test.

In view of this excellent and comprehensive bacteriological study, it is most unfortunate that the Meleney and Chatfield technique was not adopted as a standard method to be enforced by some controlling authority.

For the purpose of determining the practical value of the Meleney and Chatfield test of the sterility of catgut, especially since it was proposed to establish the test as a standard, it seemed to the author highly desirable to apply this technique to a large number of lots of sutures of all of the American brands over a considerable period of time. He decided to undertake such investigation and, beginning early in 1930 and continuing each year thereafter, he purchased periodically in the open market several lots of sutures of each of the twelve American brands of catgut.

In the course of his investigation he found that it was necessary to make chemical analysis of some of the sutures before subjecting the lot to bacteriological examination; and he also emphasized the importance of using, as a preliminary step in the technique, suitable neutralizing fluids to dissolve and remove any chemical with which the sutures might be impregnated.

The author's summary and conclusions are as follows:

1. During a period of five consecutive years including 1930, 1931, 1932, 1933 and 1934, a total of 605 lots comprising 6,184 sutures and embracing twelve brands of American made catgut was subjected to a rigid bacteriological study. The products of Manufacturers A and F were found to be uniformly non-sterile in each of five consecutive years. Two brands, made by Manufacturers E and G, were non-sterile in three consecutive years, and then, after an interval of one year in which they were sterile, were again found non-sterile, thus being non-sterile in four non-consecutive years. One brand, marketed by Manufacturer I, was non-sterile in 1930, and then, after proving to be sterile in 1931, was found non-sterile in three consecutive years, thus being non-sterile in four non-consecutive years. The other non-sterile brand, the product of Manufacturer J, was non-sterile in two non-consecutive years.

2. Based on the results of this investigation, it seems fair to assume that all catgut manufacturers in America are not using the bacteriological test proposed by Meleney and Chatfield; or, if so, they are not employing the special neutralizing solutions recommended as a preliminary step in the technique.

3. Apparently, the publication of the results of Meleney's study of catgut sterility has had little or o effect in ridding the market of non-sterile sutures, for, during each of the five consecutive years since his preliminary report was made, non-sterile sutures have been marketed by several American catgut manufacturers.

4. The results of this extensive bacteriological examination of American made catgut sutures carried out over a period of five consecutive years, as herein described, have proved conclusively that the danger of non-sterile sutures still exists, thus jeopardizing the reputations of the surgical and hospital professions, as well as the welfare and life of surgical patients.

5. Adequate control of the sterility of surgical catgut in the United States of America by some recognized authority is of vital importance. It constitutes a serious problem, and one with which the surgical profession has been confronted for many years.

**Comment:** No one, whether engaged in surgery or not, can doubt the vital importance of this communication.

—LeRoy D. Long, M.D.

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**Surgery of the Diabetic. Preoperative and Postoperative Management of the Diabetic Subjected to Surgery. Walter E. Leonard, M.D., Los Angeles, California. The American Journal of Surgery, February, 1935.**

Every patient with diabetes who is operated upon should be regarded as a candidate for coma, and its prevention is better than the cure. A high carbohydrate intake for a period of one week before operation should be the rule unless a surgical emergency arises. The carbohydrate intake varies with the individual patient, but should never be less than 100 grams in 24 hours and, if the patient is obese, should be as high as 225 grams. Insulin is used in any amount necessary to control any glycosuria which may arise.

When the patient returns from the operating room, he should receive approximately the same amount of insulin in 24 hours which he was receiving on his regular diet. Glucose should be given in amounts equal to his sugar producing intake on his regular diet. Insulin should be given in small repeated doses so that at least 75 grams of glucose are metabolised every 24 hours in the average patient, but in the obese 150 grams of glucose should be metabolised. All urine is tested for the presence of sugar and diacetic acid. The plasma $CO_2$ combining power is estimated whenever there is any clinical evidence of acidosis. If the acidosis is under control and symptoms of alkalosis occur, namely, prostration and tetany, a close check should be kept of the $CO_2$ capacity of the blood. The slightest acidosis or alkalosis must be combated vigorously.

The surgeon should bear the brunt of responsibility in operating on diabetic patients.

The proper selection and judicious administration of anesthetics, good surgical technic that avoids unnecessary trauma, and delay, contribute greatly to reducing the operative risks of diabetics in surgery.

Patients with diabetes who undergo operation are very susceptible to acidosis, but this danger can be practically eliminated by frequent urinalysis and proper treatment.

The healing of operative wounds is somewhat delayed due to the peculiar lack of resistance to skin infections even in well controlled diabetics. The healing of chronic ulcers or indolent wounds requires the closest application of surgical technic plus control of sugar metabolism. Most patients with diabetes, particularly those requiring surgical procedures, are advanced in years, overweight and suffering from circulatory disturbances and other degenerative lesions which, of themselves, make the surgical risk serious.

In view of these considerations the author thinks that the patient who requires surgery should be under the control of the operating surgeon in a well managed medical center, in cooperation with internist, intern, laboratory and dietitian. In emergency surgery, delay in transporting patients to the medical center is often fatal and the surgery should be performed as quickly as possible by the first available surgeon, whose results will be satisfactory if he guards against acidosis and alkalosis.

—LeRoy D. Long, M.D.

**Comparison of the Urinary Tract in Pregnancy and Pelvic Tumors. By Edgar C. Baker, M.D., and John S. Lewis, Jr., M.D. The Journal of the American Medical Association, March 9, 1935, pages 812 to 816.**

This report is based upon the fact that studies of the urinary tract by intravenous dyes have revealed a high degree of dilation of the upper urinary tract in pregnancy. This dilation has been shown to be more marked on the right side. In keeping with the reports of others, these authors in their own series had right-sided dilation in 92 per cent and left-sided dilation in 52 per cent. They do not give the number of patients so examined but remark that they included all of the presentations and positions of the fetus as well as twin pregnancies.

Since the stasis thus demonstrated helps to explain the reason for the frequency of pyelitis or urinary infection in pregnancy, these authors attempt to find the explanation for the dilation. They note the various causes as listed in the literature as: (1) mechanical factor; (2) hormonic factor; (3) increase in bile salts, attended with hypertrophy of the lower ureters, and (4) congestion of the lower ureters associated with increased blood supply to the pelvic organs.

They believe that the mechanical factor is of prime importance and they further think that the sigmoid plays an important part in protecting the left ureter and probably is the cause of torsion of the uterus with resultant increased pressure on the right ureter. This possibility was first brought to their attention by a postmortem examination where they found that on the left side the sigmoid formed a soft cushion between the uterus and the pelvic brim. They further investigated this point by introducing barium solution into the rectum and taking x-rays while the urinary dilation was well visualized by the intravenous dyes.

They also report 16 cases of uterine fibroids and ovarian cysts of a size comparable to that of pregnancy. In all of these cases they found real dilation of the upper urinary tract and in all cases in which the left side was dilated, the right side showed greater dilation. This was in spite of the fact that three of the ovarian cysts arose from the left side.

They therefore feel that the common factor in dilation of the upper urinary tract in such diverse conditions as pregnancy and large pelvic tumors of pelvic origin is a mechanical one. They feel that hormonic and metabolic factors can hardly be the same.

**Comment:** Many patients with large pelvic tumors, either fibroids or ovarian cysts, will show urinary tract infections and pyelitis. Even though the tumor has been present for a considerable length of time it will also be recalled that many of these patients will soon be relieved of their urinary symptoms when the tumor has been removed. It has been a fact observed by urologists and gynecologists at numerous times that pressure in the pelvis from various pelvic pathological conditions will cause slight dilation of the upper urinary tract and urinary tract infections. Though occasionally the pelvic pathology seems inadequate to account for the urinary symptomatology, its correction will not infrequently control urinary tract infections, or symptomatology. It is consequently with considerable interest that we observe such reports as this one based upon the use of intravenous dyes in large series of cases, where apparently the mechanical factor of pelvic pressure is sufficient to cause temporary or permanent dilation of the upper urinary tract with symptomatology or infection or both.

—Wendell Long, M.D.


## WHICH SIDE OF THE QUESTION ARE YOU ON?

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OR

should the problem of infant feeding be kept where it belongs—in the hands of the medical profession?

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## JEJUNAL ULCER

Roscoe R. Graham and F. I. Lewis, Toronto, Ont. (Journal A. M. A., Feb. 2, 1935), base their remarks on jejunal ulcer on their observation of forty-three cases, of which a careful and exhaustive follow up of the patients who have been submitted to a gastro-enterostomy shows a much higher incidence of jejunal ulceration than is usually suspected. A persistent gastro-intestinal disability in a patient who has had a gastro-jejunostomy demands a careful and thorough investigation. Roentgen investigation of such patients is more efficient if the clinician and radiologist cooperate as a team. Jejunal ulceration is a surgical lesion, and operation should be urged as soon as the patient's condition permits, provided the diagnosis is thoroughly substantiated. Block resection of the stomach and jejunum, with end-to-end anastomosis of the jejunum, and either a Billroth I or retrocolic Polya reconstruction of gastric continuity is the ideal procedure. A barium enema should be a routine procedure in the investigation of any patient suffering a gastro-intestinal disability after a gastro-enterostomy. The ideal operation for a gastro-iejunocolic fistula is a block resection of stomach, jejunum and colon, with triple anastomoses, together with a cecostomy.


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### PRESENT STATUS OF TETANUS, WITH ESPECIAL REGARD TO TREATMENT: REPORT OF FURTHER CASES FROM THE MASSACHUSETTS GENERAL HOSPITAL

Richard A. Miller and Horatio Rogers, Boston (Journal A. M. A., Jan. 19, 1935), report thirty-three additional cases of tetanus from the Massachusetts General Hospital, making a total of 149 cases. Since 1896, when antitoxin was first used, the mortality has declined from 80 to less than 47 per cent. Prophylactic injection of antitoxin (1,500 units) is indicated in cases of deep or puncture wounds that may be contaminated. In unusually suspicious cases this should be repeated once or even twice at intervals of ten days. The wound should, when possible, be debrided and kept open. After the onset of tetanus, every effort should be made to conserve the patient's strength by the maintenance of nutrition and fluid balance, and by the combating of muscle spasms. Tribrom-ethanol is a useful drug for the control of spasms. As soon as the diagnosis is made, serum should be given intravenously, intramuscularly or both in daily doses of from 20 to 80 thousand units up to a total of 300 thousand units. In hypersensitive subjects the process of desensitization must be instituted as soon as possible. There are no theoretical or practical grounds for the recommendation of the intraspinal administration of antitoxin. Serum reactions may be expected in about one-third of all cases treated. The immediate reactions are commonest from two to five days after the initial dose of serum, and the delayed reactions from the tenth to the fifteenth day. No fatal reactions were encountered in the present series.

### RECENT PROGRESS IN TREATMENT OF PLUMBISM

According to Irving Gray, Brooklyn (Journal A. M. A., Jan. 19, 1935), the administration of a diet low in calcium and the addition of either ammonium chloride or phosphoric acid definitely causes an increased excretion of lead. The addition of a diet high in phosphorus aids in the excretion of the lead. In several cases of chronic plumbism the lead in both the urine and the feces was increased in amount after phosphate therapy was instituted. Experimental and practical experience bears out Shelling's opinion. The addition of a high phosphorus, high calorie diet with sufficient vitamin content improved the general appearance; the nutritional requirements were adequate and the rate of excretion of lead was maintained. In the "deleading" treatment of his patients the author is now using the low calcium, high phosphorus diet with a ratio of 1-3 and 1-4. In persons who have absorbed lead it is possible that waves of liberation occur from time to time and produce symptoms of clinical activity. The lead that has been absorbed and is released at certain periods can be much more readily excreted at stated intervals with this type of treatment. Although complete "deleading" is not possible, as demonstrated experimentally, nevertheless it is reasonable to assume that the lead excreted is a large fraction of the lead that has been absorbed. The "deleading" treatment may have to be repeated at intervals if there is evidence of continued excretion of abnormal amounts of lead. It is advisable that all patients undergoing "deleading" treatment be hospitalized. The failure of acute toxic symptoms to develop when there is increased excretion is further proof of the fact that there is no parallel between the absorption and excretion of lead and the toxic manifestations. The estimation of lead in the excreta is of aid only in proving whether or not abnormal amounts of lead have been absorbed.

### CONTROL OF LEAD POISONING IN THE WORKER

On the basis of his experience Elton L. Belknap, Milwaukee (Journal A. M. A., Jan. 19, 1935), concludes that: 1. The control of lead poisoning by medical supervision is a highly specialized form of work, although it requires the broad background of internal medicine. 2. One must still have a workable course of scientific treatment of lead poisoning to care for workers until the engineers have made lead absorption impossible. 3. A clinically proved and detailed method for the control of lead poisoning in the worker at work is presented, which consists of a stringent preemployment examination by the physician himself, periodic reexaminations at least every two weeks to three months, according to the intensity of exposure. Included in the periodic reexaminations there must be a record of laboratory studies, whenever a man is reexamined, a hemoglobin and a stipple cell count must always be made and the results on the periodic examination must be analyzed frequently by the medical consultant so that treatment may be changed immediately, if necessary, and recommendations made for further precautions against exposure. 4. One should not wait for disability before one starts treatment. 5. Thoughtless and wholesale calcium treatment may be unwise, but when given advisedly it is of specific aid. 6. Even the so-called insusceptibile workers may have relatively large quantities of stored lead ready to be liberated by natural or artificial means. 7. With perfectly controlled technic, in selected cases, artificial deleading of cases previously heavily loaded with lead is a benefit not only to industry but also to the worker, and it is safer than uncontrolled spontaneous deleading.

## REPORT OF EXAMINATION FOR LICENSES TO PRACTICE MEDICINE

Examination held at State Capitol, Oklahoma City, March 12th and 13th, 1935. The following applicants passed:

| Name | Year of Birth | Place of Birth | School of Graduation | Year of Graduation | Home Address or Previous Location |
|---|---|---|---|---|---|
| Lee, Robert Ray | — | Dublin, Tex. | Univ. of Okla. | 32 | Okla. City |
| Pryor, Victor W. | 08 | Konawa, Okla. | Univ. of Tenn. | 32 | Holdenville, Okla. |
| Shelton, Joel | 02 | Granite, Okla. | Univ. of Okla. | 34 | Temple, Tex. |
| Burke, Richard Michael | 03 | Langdon, N. D. | Univ. of Minn. | 30 | Sulphur, Okla. |
| Casebeer, Harvey Lee | 07 | York, Neb. | Univ. of Nebr. | 32 | Alva, Okla. |
| Howard, Robert Lowe | 97 | Indianapolis, Ind. | Western Reserve | 28 | Okla. City. |
| Hudson, Margaret Grove | 97 | Anandale, Pa. | Johns Hopkins | 24 | Tulsa, Okla. |
| Stuart, Frank Allan | 04 | Jackson, Miss. | Univ. of Tenn. | 30 | Tulsa, Okla. |
| Guthrie, Oscar Vanonda | 86 | Townley, Ala. | P & S Little Rock | 10 | Roff, Okla. |
| Walker, David A. | 74 | Carthage, Ill. | Keokuk Med. Col. | 02 | Mullen, Nebr. |
| Lindgren, Russell Cyrus | 07 | Stillwater, Minn. | Univ. of Minn. | 32 | Guthrie, Okla. |
| Dunham, Howard Conner | 01 | Ceres, Okla. | Tulane Univ. | 30 | Sulphur, Okla. |
| Nauheim, Herbert Sally | 1900 | Darmstadt, Ger. | Heidelberg Univ. | 23 | Tulsa, Okla. |
| Navin, Kenneth William | 07 | Mitchell, S. D. | Creighton Univ. | 33 | Konawa, Okla. |
| Schuman, Irving | 07 | Chicago, Ill. | Univ. of Ill. | 34 | Tulsa, Okla. |

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